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CLINICAL MEDICINE

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APRIL 1945

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VOLUME 52 APRIL, 1945 NUMBER 4

Dark Field Microscopy in Infections

By WILLIAM W. YOUNG, M.D., *Philadelphia, Penn.*

Dr. W. W. Young

Dark field microscopy of the blood is a procedure that has never been carefully carried out.

The author has done much study in the field and believes that such an examination is a very delicate test to indicate when the body defenses against infection are becoming less effective.

EXCEPT for an occasional examination of the hanging drop for identification of the spirochete or allied organism by the specialist, the dark field scope has had little use either in the clinic or the experimental laboratory. While the study of the formed elements by means of the direct light and various stained specimen has been extended, that of the formed and unformed elements by means of refracted light has been ignored by all but a few. Yet this phase of hematology deserves attention as I shall endeavor to point out.

Equipment

An ordinary microscope in which the abbe condenser has been replaced by a dark field sub-stage condenser is satisfactory. Since these two condensers can be interchanged, the same scope can serve both purposes; that of dark field and also that of ordinary microscopic work. The source of light must be adequate for satisfactory results and this can be obtained by means of a number of lights designed for this purpose. The bulb in all these lamps is usually that used for a projection machine or one of equal illuminating power together with a convex lens for concentrating the beam. Ordinary glass slides and cover slips, oil immersion lens, mineral oil, pipettes finely drawn and a centrifuge complete the list of necessities.

Preparation of Specimen

Blood is taken by any method desired; by needle or from the finger or ear. Since a minute amount is needed for the examination itself, the micro method is ideal. The author has found a vial of five drop capacity with a rubber cap very satisfactory. Several of these can be carried in a wallet. The specimen is allowed to clot. Any time after this, it is centrifuged to throw the clot to the bottom. No diluent or preservative is used and a reliable reading can be had in twenty four hours; longer if the specimen is refrigerated. A moist syringe (with alcohol or water) or agitation beyond a certain degree will hemolyse the blood and make it unfit for use. A small drop of the serum is drawn into a pipette and placed on a clean slide and covered with a cover slip. Contact is made between the sub-stage condenser and the slide with oil and also between the oil

immersion lens and the slip. The field is now brought into focus.

The Dark Field

In the ordinary microscope, light rays reach the eye directly through the transparent material in the serum. In the dark field, it is necessary to use light coming onto the field at an angle. Therefore, in dark field work, refracted light is used which necessitates a strong source of light since so much of it is lost. In the event there is nothing in the field, it is an empty blackness, but when substances are in the field they appear as white against a black back ground. The point of optimal focus is at the convergence of the converging rays of light.

Contents of the Field

In the routine examination, red blood cells appear as large rings, clear cut and perfect, in normal sera. Their protoplasm does not show. They have no motion except from convection currents.

The polynuclear cells appear as mammoth, brilliant white masses with a fine membrane. The nucleus is finely granular and the protoplasm is composed of hundreds of small bodies, never quiet, shoving each other around as it were, packed in like sardines and trying to get out of the membrane. The whole cell slowly projects pseudopodia.

The lymphocyte is a large mass also, but the nucleus is not easily distinguished and, although the protoplasm is composed of the small round bodies as in the case of the polys, they are not as active or energetic.

Despite the most aseptic precautions, many sera will be found to contain bacteroid forms, chain, rod, spiriliform, active, inactive. Their significance is at present unknown but they can hardly be attributed to contamination.

Fat globules are found in varying numbers, discrete as a rule, having no brownian motion and varying from two to five microns in diameter.

Literally millions of dancing, tiny white dots varying from a micron in size down to a point where they are no longer visable at this magnification, approximately 2000, have been termed chylomicrons, ("blood dust"). They display a more or less energetic brownian motion at all times. This is a term of colloidal and electro-physical chemistry. It means that the particles are in a constant vibrating, dancing motion independent of the convection currents and signifies that these substances are present in the form of a colloidal sol, that they have a high surface tension and charge.

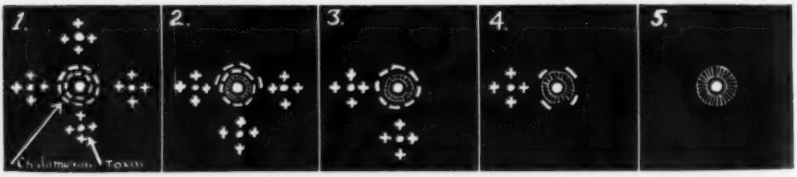
Changes To Be Observed

The red cells, in infections and toxemias, tend to form rouleaux (collect in long rolls) rapidly, an observation that permits the examiner to judge, after some experience, the sedimentation rate. With dehydration, they lose their roundness and become stellate (star shaped), shrunken, and the protoplasm comes into view as a homogeneous mesh. The desirability of intravenous fluids can be quickly appreciated.

The polynuclears, under the influence of toxemias, become sluggish and fail to display pseudopodic motion. Their protoplasm also becomes sluggish, does not vibrate, the tiny bodies seem to be content to remain dormant and confined. Some cell membranes rupture and lose their protoplasm. Finally the cell becomes, to all intents, dead. In hemolysed blood and severe toxemias, fragments of the polys will be present and call for distinction between them and clumps of the chylomicrons.

The bacteriod forms are present in acute as well as chronic illness. In the chronic forms of sickness, they are apt to be active and look like spirillum. In acute and sub-acute types, they appear like rods or darting dots or chains. As the patient improves, they lose their motion and finally disappear. They are never seen in normal sera.

In overwhelming and advanced chronic toxemia, regardless of the amount of centrifugation, the serum will display a network of fibrin. Somewhat the same finding will be had if the



Diagrammatic illustration of surface adsorption.—1. Chylomicron with 16 negative surface charges—4 particles of toxins each with 4 positive charges. 2, 3, 4. Showing increase of mass of chylomicron as adsorption proceeds, and 5, loss of charges. This is a colloidal chemotaxis.

specimen is not allowed to thoroughly clot before centrifugation.

Fat globules, rings of two diameters without brownian motion, which the English designate as "white particles," are most numerous after a meal and disappear from the normal serum within an hour or so. In patients with chronic or acute hepatic hypofunction, they are routinely present. If they reach a diameter of five microns or more, they are of no value as toxophyllic buffers and signify definite lipemic pathology. These globules may be discrete or in clumps and the rules applying to colloidal gels may be applied to their behavior and appearance.

The information obtained thus far from the dark field is not inconsiderable. But the above changes are of secondary importance to those that are to be described. Since these are slightly more involved than the above, it is best to explain them at greater length.

Chylomicrons in Normal Sera

The chylomicron is to be seen as a small, pin-point dot in the dark field displaying energetic brownian motion. In the normal serum, there are approximately 80,000,000 per cm. Because of their size and motion, their number cannot be counted but is usually estimated as so many tenths increase or decrease over or below the normal. Under normal conditions of health, their size averages 0.5 microns or less; they are never found in clumps and they repel one another violently.

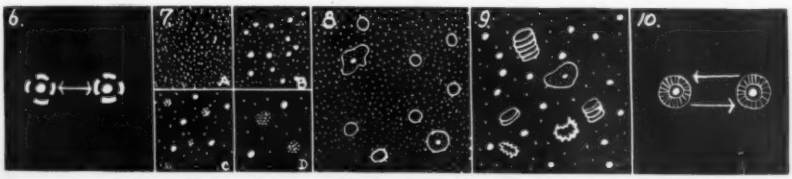
They are derived from the undifferentiated lipoids in the chyle. The differentiation is accomplished by groups of specialized cells derived from the mesoderm and located in various sites thruout the body. These cells have the same parentage, embryologically speaking, as the hemopoietic cells. The chylomicron itself is a tri-cholesterol ester of palmaic, oleic and stearic acid. These acids are unsaturated. The chylomicron is present as a colloidal sol, and has an electro-negative surface charge.

In infections and toxaemias, the above described normal finding as regards them undergoes certain changes. These changes are of four categories; size, number, motion, degree of clumping. An evaluation of all four categories is necessary to a final judgment if only because, in colloidal chemistry, one deals with the state of matter and not quantity alone.

In the very earliest stages of infections, there occurs what might be described as a chylomicrotosis, an outpouring of these particles, analogous to a leucocytosis. Depending on the factors contributed by the host, this state may be long or short in duration. The individual particles then begin to enlarge as the toxemia increases. As the particles become larger, they exhibit less and less energetic brownian motion until they repel one another feebly and then tend to form clumps of varying sizes. Coincident with this, there is an increasing diminution in their number. These findings find immediate correlation with the clinical progress as this process is reversed as clinical improvement is noted. The dark field is more delicate than the white count and far more revealing.

Changes in Chylomicrons in Toxemias

The literature on colloids and especially fat colloids in infections is increasing year by year. From it, we are permitted to draw the conclusion that these changes are the result of definite electrophysical laws. Recall first that the chylomicron had a surface charge which



6. Fully charged chylomicrons repel one another.
7. A. Field of chylomicrons—size 0.5 microns or less—motion energetic—evenly dispersed.
   B. Some chylomicrons begin to enlarge—lose motion.
   C. Some chylomicrons form into small clumps—number present diminishes.
   D. Large clumps—large chylomicrons—number almost zero.
8. Dark Field—normal—finely dispersed—active chylomicrons—active leucocytes—normal red cells—normal lymphocytes.
9. Dark field—abnormal—large chylomicrons—total number diminished—red cells crenated and in rouleaux—dead lymphocytes.
10. Chylomicrons—charges neutralized—tend to adhere to one another.

is electronegative. This charge is not negligible. Follow this premise with another to the effect that the toxins of most bacteria, all heavy metals, snake vena and many drugs act as electropositive colloids and we have a syllogism from which we can draw certain logical conclusions. The first is that all electro-negatively charged substances are attracted to the chylomicron; colloidal chemotaxis. Add to this the fact that all lipoids, by their very nature, exercise an adsorptive property toward many things; odors, pigments and so forth, and one is impressed with the significance of the role of the chylomicron in toxemia. It has been demonstrated that the smaller the particle, the larger its surface charge, the greater its adsorptive properties, the more energetic the brownian motion; that particles above 5 microns are useless as detoxificants. Once the toxin is absorbed to the chylomicron, it loses its irritant properties and this bond is not easily broken, although it is not a chemical union. With these facts known, the behavior of the chylomicron in the dark field is rationalized. It can be succinctly described as follows:

The toxin is attracted to the chylomicron due to opposite charges. With adsorption, the chylomicron takes on mass and weight, loses surface charge. Coincident with this, its inertia increases and its brownian motion decreases. Enlarged and discharged, it is no longer valuable and is removed to be replaced by others. As long as the host provides replacements, the vital cells and organs of the body are spared the toxicological effects of the poison in question. Thus the dark field is an accurate accounting of a certain aspect of functional diagnosis and prognosis.

The chylomicron can be regarded as a toxiphyllic buffer, circulating thruout the blood and lymph channels, but not the spinal fluid. This protective, lipoid, colloidal buffer system is always operative but under certain conditions may break down. Its integrity can be immediately ascertained through the instrumentality of the dark field.

Clinical Implications of Dark Field

What happens when this buffer system fails? The answer is to be found in any standard work on pathology. The body is constantly being invaded by bacteria or exposed to poisons but this system is as a general rule competent to preserve health. In the dark field, this is reflected in the presence, even in the healthy, of a certain percentage of large chylomicrons. But there comes a time when, as a result of a number of conditioning factors, infection and its coincident toxemia is so great as to be recognized as a disease entity. Under such an exigency, this buffer system may be strained or give way entirely. The microscopist may watch this process. The toxin, failing to be absorbed by the chylomicron, then affects the fixed cell or the blood cell.

A small amount of toxin irritating a fixed cell results in an increased functional output of that cell clinically defined as leucocytosis, fever, sweat, inflammation, redness, swelling and pain. Histologically, the cell is shown in a state of cloudy swelling. Increasing doses of poisons result in an increase of function up to but not beyond a certain point at which depression of function sets in. Histologically, the cell is now in a state of fatty infiltration This fat is not generated in the cell itself but is transported to the cell and is a protective measure. Excessive doses of poison lead to decided depression of function and final destruction of the fixed and circulating cell as has been described in a previous paragraph. Histologically, such a cell would be in the first stages of amyloid degeneration to be finally replaced by scar tissue.

The role of the colloidal, lipid system can be appreciated only if these facts are realized. The value of dark field microscopy only then is understood and the changes observed in the serum made intelligible.

The question might well be asked, what is one to do if it is found that the buffer system has broken down? The obvious answer would be to employ an artificial buffer if one were available. Why? Obviously, if the degree of toxicity is inversely proportional to the integrity of, or capacity of, function of the fixed vital cells of the organs and tissues of the body, (upon whose continuing adequate functioning the severity, longevity and extent of the disease depends, a statement which has to do with sequele, convalescence, prognosis and residual damage) then the reverse holds true also. The clinician, if he had a means of lessening the free toxins, could conserve the vital parts and in so doing contribute to recovery.

One's first thought would be to employ a fatty diet, high in cholesterol. The fact that the blood might be high in cholesterol would be no reliable guide since it is not quantity but the state of matter with which we are concerned. Also, the fat globule, being as it is larger than two microns is of very little value as a buffer. Then too, in the in-

fectious state, the hepatic and other cells have been rendered defective functionally so that assimilation of the fat and its change from the undifferentiated chyle into the colloidal sol state may not be adequate to the emergency.

The clinician does have available two artificial sols, both physiologically acceptable, that he can use when, by means of the dark field, he is aware of their being indicated. In England, a concentrate is in use which is injected into the muscle tissue as a depot. In this country, one has been developed which is infused into the vein. Both have had more than a decade of clinical use to prove their merit.

The use of such an artificial colloid is not any part of the subject matter of this editorial. The purpose here has been to outline briefly, the technique of dark field microscopy in infectious states.

1419 Spruce Street.

The Cerebral Arteries

Four arteries carry all the blood to the brain, namely: right and left internal carotids, right and left vertebrals. These form the arterial circle from which the three large cerebral arteries arise, i.e., anterior, middle and posterior cerebrals. The circle is completed by the anterior and posterior communicating branches.

Middle cerebral: Largest of the three arteries; arises directly from the internal carotid; supplies the territory of insula and the fissure of Rolando.

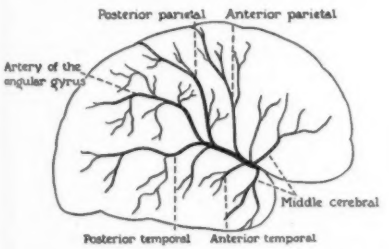
The middle cerebral and its ganglionic branches are most frequently occluded in cerebral accidents, leading to cerebral hemorrhage and typical palsies.

Note: Definite collateral branches, such as the lenticulostriate artery of Duret and the artery of cerebral hemorrhage (Charcot) are of doubtful significance and constancy. Some anatomists include in the lenticulostriate group the main supply to the basal ganglia.

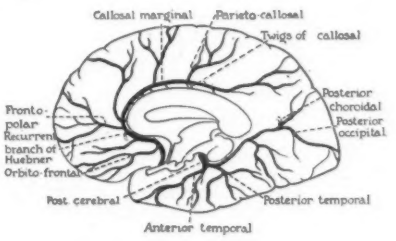
All superficial vessels anastomose freely in the pia. Cortical and ganglionic twigs anastomose freely with each other in the brain substance. The nuclei and ganglia of the brain have a much richer network of anastomosing vessels than the white matter. Each ganglion has its own peculiar vascular architecture called into being by the individual and peculiar needs of that ganglion.

All pial and medullary ganglionic branches are supplied with vasomotor nerves: Vasodilators from the VII cranial nerve by way of the greater superficial petrosal nerve, and vasoconstrictors over the sympathetic plexi on the internal carotid and its branches, and the middle meningeal arteries.

[The Anatomy Department of Creighton University School of Medicine, Omaha, supplied these anatomical facts in answer to a physician's inquiry.—Ed.]



The branches of the cerebral arteries on the convex (outer) surface of the right cerebral hemisphere.



The distribution of the anterior and posterior cerebral arteries on the internal (mesial) surface of the right hemisphere of the cerebrum.

Speak of men's virtues as if they were your own, and of their vices as if you were liable to their punishment.—*Cheeriology.*

Swimming for Health

By CORNELIUS J. SEAY, M.D., *Scarsdale, N. Y.*

BY swimming for health is meant the ordinary methods of swimming indulged in by many individuals, either regularly or at intervals, during the summer months in the waters of the sea, lakes or rivers.

Usually the overhand or breast stroke is employed with the body lying prone in the water. Primarily the position of the body is the important factor in making swimming the ideal health exercise. Sporting events or competitive efforts are not included in this category as they demand considerable effort for only a short period of time—the action is too sharp and too short. Apparently, swimming is the most primitive form of exercise. It runs back to the period when man was amphibious, and was instinctive. Today it is a dormant trait that has to be awakened by physical exertion and experience. Consequently, it may be said that no one ever really learns to swim, only the dormant urge has to be brought back to activity.

My attention was drawn to the relationship of bodily position to healthful exercise while collecting clinical and research data in connection with the development of chronic arterial hypertension and its bearing on arteriosclerosis. This data was collected over a period of thirty years and was obtained from many sources in this country and abroad. For instance, it was found that the prone position produce these physiological results in the abdominal organs. (The reactions mentioned below are instrumental in making swimming the most desirable form of exercise):

1. Reduces excessive pressure in all abdominal organs.
2. Stimulates venous and capillary circulation throughout the body.
3. Correlates action of the sympathetic and parasympathetic nervous systems to bring about vasomotor balance.
4. Relieves abnormal arterial, venous and nerve kinks and loops in the abdominal cavity.
5. Restores abdominal viscera to their proper anatomical relationship to each other.
6. Relieves venous pressure in the rectum and legs.
7. Relieves the heart from nerve strain and delays degeneration.
8. Increases cell nutrition.
9. Stimulates adrenal gland secretion.
10. Increases peristaltic action of the intestines and promotes glandular activity.

Two or more of these factors acting in harmony have a tendency to reduce the general blood pressure from 10 mm. to 12 mm.

A subscriber to *Clinical Medicine*, referring to my note in *Urologic and Cutaneous Review*, asks: "Where did you get the figures on decrease of intra-abdominal pressure in the prone position?" That is a pertinent and basic question and deserves a full and adequate answer because of its importance. That particular piece of research was done by Dr. P. B. Barringer, retired professor of Physiology at the University of Virginia in 1923. He reported as follows: "I had the Taylor Instrument Company of Rochester, New York, make me a special U tube manometer, (mercury or water, zero in the middle, sliding scale)."

With Y tube, bulb pump, connected manometer, and a long rectal tube I, in turn, tried many experiments, but one must suffice here. A large soft rubber condom was slipped over the terminal end of a rectal tube and tied firmly in place. The condom was pumped up to 1½ to 2 inches in diameter. The manometer reading was found to be about 10 mm. plus.

Next, the pressure was released, the condom allowed to become flaccid, then oiled and introduced into the rectum as far as possible. The pressure was slowly pumped up to 10 mm. Variable manifestations appeared but in a few minutes adjustment of the abdominal muscles occurred and the mercury rested at 12 mm. plus. The subject was on his right side.

The scale was loosened and slid until the zero is brought up to the level of the mercury at its new position. When the subject stood the reading was about 10 mm., the measure of burden (bipedal) borne daily.

With the patient on all fours, or knee chest position, the pressure dropped below the new level (negative pressure). In the quadrupedal sleeping position, the pressure was nearly always negative. A gas laden bowel results in a plus reading anyway you fix it but in this posture,

the average man who is not too fat is shown to have a negative pressure. This experiment showed that the intra-abdominal pressure has decreased from 10 to 12 mm. reading, to a negative pressure level.

Incidentally it is interesting to note that President Roosevelt's physician selected swimming as the best form of exercise for him. Babies instinctively assume the prone position when possible, and the small boy who has eaten too freely of green apples invariably rests upon his belly for relief.

Practical Pointers on Diagnosis and Treatment

By R. L. GORRELL, M.D., *Trinidad, Colorado*

SO MANY worthwhile ideas are lost in the rush of present day medical publishing that is seems worthwhile to assemble a few of the more important in very brief form. I make no attempt to have these notes cover only topics published or used clinically during the past year but will include all of value regardless of date of origin.

For easy reference, one may keep copies of CLINICAL MEDICINE on a handy shelf or the individual items may be cut out and pasted on the sheets of a loose leaf notebook by someone in the office or family. They may be classified alphabetically or, better, under the general topic to be considered.

Edema, Cardiac, Treatment

The intravenous injection of Theophylline-Salyrgan every second day alternated with the intravenous injection of aminophylline, the use of a salt free diet and large doses of digitalis will usually relieve cardiac edema. The occasional resistant patient with persistent edema and labored breathing will respond very promptly to the use of oxygen for 12 to 24 hours. If oxygen therapy is not available, inject air under the skin with a large syringe and ordinary hypodermic needle until 500 cc. have been given. This procedure is not painful, if done slowly, as air is compressible and is quickly absorbed.

Numbness, Hand or Arm

The causes of numbness of the arm are (1) allergy (it may be the first symptom of migraine), (2) overuse or unusual heavy exertion, such as farmers in plowing season, mechanics using heavy wrenches, (3) vitamin B deficiency, (4) cervical rib, (5) pernicious anemia, diabetes, severe secondary anemia, tabes, subacute combined degeneration and other causes of degeneration of the posterior columns of the spinal cord, (6) blood vessel affections and (7) spinal cord tumor.

If no organic cause can be found, relief can be given often by having the patient soak his hands in hot water for 3 minutes, then in cold for 1 minute, and repeat the process four times in succession until this "contrast bath" stimulates circulation, at least once daily.

Headache, Pressure Type

The pressure or "weight" type of headache is usually due to a neurosis; it is often persistent for days and is increased only by emotional excitment.

Blood Pressure, Low

Be sure to explain to the patient that low blood pressure in itself *does not require treatment*, that his type of heart and blood vessels are built for the long haul thus ensuring him a longer life without fear of apoplexy or cardiac breakdown (many patients have high blood pressure confused with low blood pressure). A drop of 5 to 15 points in pregnancy is normal (pregnancy hypotension).

Low blood pressure may be found in association with anemia, hypothyroidism, myocardial insufficiency, wasting diseases as malignancy or tuberculosis, and of course, Addison's disease.

(Those scientifically minded will be interested to know that circulatory efficiency does not suffer under ordinary conditions of hypotension, as the regulatory mechanism of the arterioles chiefly determines the pressure in the capillaries without regard to the level of pressure in the arteries. Blood pressure in the brachial arteries is 10 mm. below that in the aorta, and in the digital arteries 20 mm. below that in the aorta, so there is a drop of 20 mm. from the aora to the peripheral vessels. The normal capillary pressure ranges from 10 to 25 mm. of mercury, as compared to the usual brachial pressure of 110 to 150 mm. (Hugh J. Morgan, M.D. Professor of Medicine at Vanderbilt University.)

Melanoma

By JOSEPH URKOV, M.D., *Chicago, Illinois*

WHEN an innocent looking mole that has been subjected to irritation and friction changes color and becomes cancerous, it is usually highly malignant and therapy usually too late.

Correct prophylaxis will reduce mortality. *It is advisable to remove all moles that are subject to chronic irritation,* especially if they are situated on the head and neck.

The potentially malignant offenders are the smooth black nevi, moles that change in color (to slate gray), moles that break down and ulcerate and moles that continue to grow. The hairy mole rarely if ever becomes malignant.

Prophylactic therapy should be exact and thorough. Melanomas are resistant to X-Ray and radium. Chemical destruction is slow and dangerous.

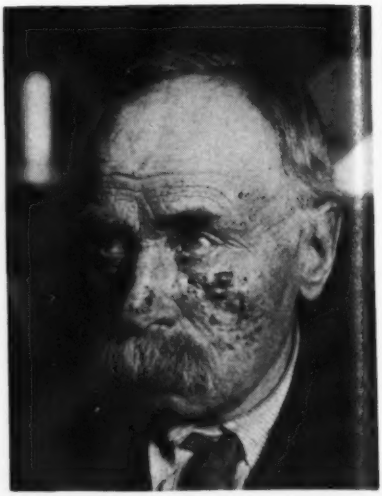
Fulguration or electro-dessication must be complete, rapid and thorough. A small area left untreated may quickly ulcerate and cancer cells enter the lymph channels.

For surgical removal the entire growth is excised quickly. The defect is approximated by undermining the surrounding area. The defect that is too large for immediate closure can be covered later with a split or full thickness skin graft.

The recommended prophylactic treatment for melanoma of the face and head is by fulguration, dessication or the cold knife.

When *fulgurating* use 1% novocaine solution and inject intra-dermally. The fluid elevates the growth and the full sparks attack the entire mole plus a narrow margin of surrounding healthy skin. The spark is continued until the mole is completely destroyed. It is well to advise the patient that an indentation may result when the destructive growth falls off and that complete destruction without cosmetic consideration is necessary. The treated area is protected from rub and irritation for ten days to two weeks, which is the time required for complete separation.

Electro-dessication: 1% novocaine solution infiltrates the skin margin of the growth. A flat smooth cautery blade is kept at amber heat and the excision goes through the healthy skin surrounding the melanoma down to the underlying fascia. The excision is rapid and complete and the wound is dressed every two days until it closes by scar contracture. If the resultant scar is large it may be excised and the wound covered with full thickness skin graft.



Malignant melanoma of the face. Photo through courtesy of Dr. E. T. Bell.

Surgery: When the scalpel is used, the excision should be rapid and complete. Do not leave a part of the melanoma even if it extends into the tarsus of the eyelid.

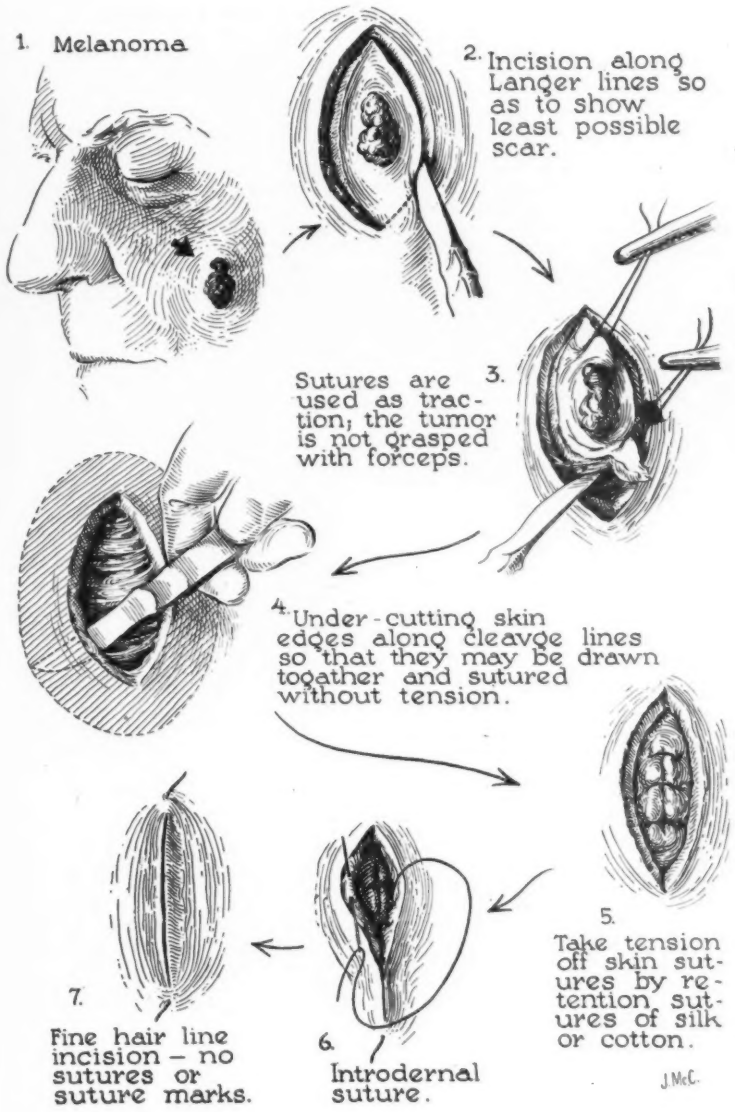
Malignant melanoma of the head and face are basal cell and squamous cell. The latter type is highly malignant and metastasizes extensively.

Prophylactic lymph node dissection of the neck is done with both cell types, especially the squamous cell. This operative procedure, when the metastasis is to the lymph glands only, may effectively reduce mortality.

55 E. Washington St.

[E. T. Bell, M.D., Professor of Pathology at the University of Minnesota, teaches that all moles on the feet should be removed as this area is especially dangerous, also that the prognosis of malignant melanomas is not as bad as was formerly believed. A persistent ulcer under the nail should be biopsied, as subungual melanoma must be diagnosed early.—Ed.]

Suggestions in the Surgical Excision of Melanoma


1. Melanoma
2. Incision along Langer lines so as to show least possible scar.
3. Sutures are used as traction; the tumor is not grasped with forceps.
4. Under-cutting skin edges along cleavge lines so that they may be drawn together and sutured without tension.
5. Take tension off skin sutures by retention sutures of silk or cotton.
6. Introdermal suture.
7. Fine hair line incision – no sutures or suture marks.
J.McC.

The Evaluation of Germicides

By F. J. VON GUTFELD, M.D.,* *Richmond, Virginia*

IN the evaluation of germicides†, for practical purposes, many different qualities of the germicide beside its germ killing power have to be considered, e.g.: toxicity, corrosive and staining properties, odor, stability, inflammability, price, and so on. For this reason, and because the purposes for using germicides differ widely, the often heard general question: "What is the best germicide?" should not be asked. Rather would *it be appropriate to specify the purpose for which the germicide is to be used.*

Suspension Method

In testing the killing power of a germicide the two principal methods are the "suspension" and the "carrier" methods. In the suspension method a pure culture of the microorganisms is suspended in distilled water, saline or other liquids. A germicide of desired concentration is then added, and after various periods of time a small amount of the mixture is transferred to a nutrient medium. After incubation we can find out the concentration and the length of time necessary to kill the microorganisms.

Carrier Method

The carrier method used "carriers," e.g. cotton threads, glass beads, etc. which have been infected with a pure culture of bacteria. These carriers are immersed into the disinfectant, removed after varied intervals, rinsed with sterile water or other suitable liquids, and transferred to a nutrient medium. After incubation we obtain information as to time and concentration necessary to kill the bacteria under trial.

The advantages and disadvantages of these two methods shall not be discussed in the present paper. It might suffice to point out that numerous modifications of both methods have been elaborated in order to improve their reliability. The majority of these procedures has been worked out on bactericidal agents. Finally official methods have been developed, which have come to be considered standard. (for bibliography reference).

In these methods the bactericidal power of chemicals is tested against a pure culture of Eberthella typhi or (and) Staphylococcus aureus. The standards for the resistance of these two test organisms "have been firmly established and provisions for the use of other organisms have been added."

Reddish[2] suggested seven species of pathogenic bacteria which are "representative" of their respective groups, namely: Bacillus typhosus, Staphylococcus aureus, Bacillus diphtheriae, Bacillus tuberculosis, Diplococcus pneumoniae, Streptococcus hemolyticus and Bacillus pestis.

Despite this well founded suggestion the vast majority of tests are still carried out only with Eberthella typhi and Staphylococcus aureus.

It should be emphasized, however, that even by including the aforementioned group representatives, the result might be inconclusive. This fact is demonstrated by a series of experiments this author carried out with a well known disinfectant. In concentrations between 1 : 12,000 and 1 : 40,000 it kills within 10 minutes Eberthella typhi, Staphylococcus aureus, Streptococcus hemolyticus and other bacteria. For special reasons, Pseudomonas aeruginosa (Bacillus pyocyaneus) was used, and it was found in repeated experiments that a concentration 1 : 1,000 did not kill the germ after 40 minutes.

For practical purposes the germicide is usually applied in a higher concentration than necessitated by the experimental results (usually about five times this concentration). The aforementioned case demonstrates that even this margin of "safety" would not be safe.

In testing germicides against pure cultures we almost entirely forget that under *natural* (not experimental) *conditions* it is our task to kill not a pure culture, but almost invariably combinations of two or more germs; combinations, by the way, of variable composition and unknown proportions. Since we know that in such a mixture of microorganisms antagonistic and/or synergistic interactions or both often take place, it seems justified to question why this fact is not taken into consideration[3]. In other words, germicides should be tested against mixtures of germs. The objection might be advanced that it is impossible to try all conceivable combinations, but a well selected choice of "representative" mixtures should provide useful preliminary information.

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†The expression "germicide" comprises fungicidal, bactericidal and virucidal agents.

The concept of the biological entity prompted a new method of testing fungicides which was elaborated some years ago[4]. By means of suitable carriers upon and within which the molds grow, the fungus in its natural contexture is subjected to the action of the fungicide.

In the official circular No. 198 of the U. S. Dept. of Agriculture concerning the testing of antiseptics, special consideration is given the composition of the nutrient medium. It must contain Liebig's beef extract and Armour's Peptone (special brand for disinfectant testing) among other ingredients. Since the composition of neither beef extract nor peptone is exactly defined, and since even in normal times these products were occasionally hard to obtain, a chemically defined medium, which can be compounded and which will be the same everywhere, would appear preferable.

In either the suspension or the carrier method, the germicide is brought into direct contact with the microorganisms to be acted upon. This procedure then offers the germicide the optimum chance. These conditions are obviously far from natural. This fact of course has long been realized, and many modifications have been suggested to simulate natural circumstances. Serum, dried feces or skim milk have been added for this purpose. These substances partially inhibit the germicidal action, requiring more time or higher concentrations to kill the germs.

These modifications, however, do not take into account the fact, that under natural conditions the microorganisms are very often embedded in substances such as living tissues, mucus and many kinds of inanimate material. In order to kill the germs the germicide must penetrate the material in which the microorganism are embedded.

It would then seem necessary to test the penetrating power of germicides in order to get more information about their effect under natural conditions.

Various procedures which previously have been described, do not meet the requirements as I stated elsewhere. I succeeded in elaborating a method to determine the penetrative power of germicides. This "method of embedded germ carriers" can be used under widely varied conditions, and therefore fulfills all the essentials which can be expected[5]. Briefly the procedure is the following:

Infected carriers, e.g. cotton threads, are placed onto the surface of an agar plate and covered with a layer of agar of desired thickness. The threads are now "embedded." The germicide is poured on top of the covering layer. After varied periods of time a string is removed, rinsed and transferred to a nutrient medium. It is surprising how much a thin layer of 1 per cent agar retards the germicidal action. This new method can be used with different kinds of germs (fungi, bacteria, vira) either in pure cultures or in mixtures. Modifications of the substance to be penetrated as to material, concentration and thickness of the covering layer are possible. Various germ carriers as well as germicides (liquid, solid, gaseous) may be used. Finally the temperature at which the tests are done can be chosen according to the actual needs.

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To have worked is to have succeeded—we leave the results to time. Life is too short to gather the harvest—we can only sow. —*Elbert Hubbard.*

Infiltration Therapy in Acute Calcific Tendinitis

By PAUL W. LAPIDUS, M.D., F.A.C.S., *New York, New York*

Anatomical Background

ALTHOUGH calcific tendinitis may occur in almost any part of the body, it is most commonly observed at the shoulder joint. One reason: The evolutionary changes of the upper limb. With adaptation of the upright posture, the humerus became suspended from the body; while originally in the quadrupeds, it was designed to bear weight similarly to their hind limb. Thus the capsule and the musculo-tendinous cuff of the shoulder joint in man became subjected to tensile stress. The articular surface of the humeral head is four times greater than that of the glenoid fossa[1]. Because of this difference, the scapulo-humeral articulation has a very large joint capsule and has the greatest range of motion of any other joint of the body. The hypermobility of the arm is further augmented by the moveable attachment of the scapula to the thorax. Thus the evolutionary changes, large joint capsule and hypermobility of the shoulder joint seem to make this joint one of the most vulnerable to any acute or chronic traumatization. The dislotion of the shoulder occurs more frequently than at any other joint of the body.

As pointed out by Duplay[2] and later by Codman[3], the subacromial bursa may be regarded as a "second shoulder joint." Part of the ceiling of the subacromial bursa consists of the osseoligamentous socket formed by the overhanging acromion and the coracoacromial ligaments. The floor of the subacromial bursa is supplied by the upper part of the capsule of the shoulder joint together with the musculo-tendinous cuff (mainly the tendon of the supraspinatus muscle) (Fig. 1). Lifting any weight puts the upper part of the joint capsule, or the floor of the subacromial bursa, under a strong tensile stress. On the other hand, when something is pushed with the hand or when one falls forward on the outstretched hand, there is a reversion to the primitive mechanical condition present in quadrupeds. An upward thrust of the arm is produced. The upper part of the joint capsule (floor of the subacromial bursa, supraspinatus tendon) becomes compressed, as in a

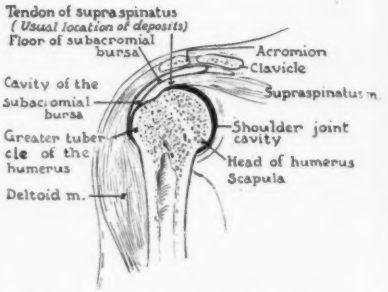

Fig. 1. Schematic drawing of the shoulder joint sectioned in frontal plane. Note the supraspinatus tendon separating the cavity of the shoulder joint below from that of the subacromial bursa above. The subacromial bursa may be looked upon as a "second" cavity of the shoulder joint. The point of the arrow in the supraspinatus tendon shows the usual location of the intratendinous deposit near the insertion of the tendon into the greater tubercle of the humerus.

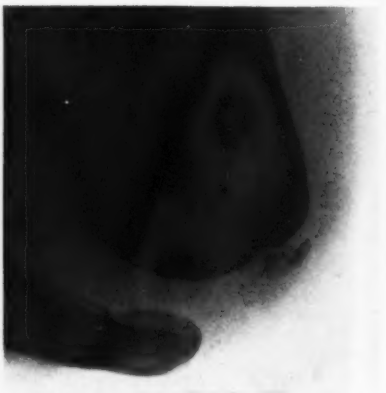

Fig. 2. Case of Doctor I. L., 36 years old, with very acute calcific tendinitis of the right shoulder. Roentgenogram of the right shoulder taken on March 11, 1940, after thirteen days of agonizing pain keeping him awake at night and requiring frequent use of narcotics. Note a small, dense, apparently intratendinous deposit close to the greater tuberosity. Above it there are several other calcareous masses which evidently became extruded into the cavity of the subacromial bursa.

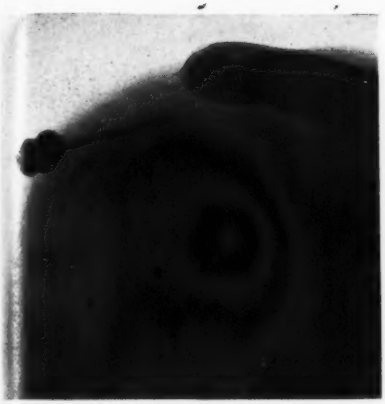

Fig. 3. Roentgenogram of the same shoulder taken a few minutes later with the needle in situ. Note that the needle is in wrong position and its point is far away from the deposit.

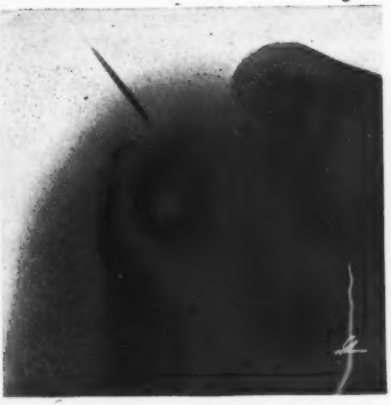

Fig. 4. Roentgenogram of the shoulder after correction of the position of the needle and infiltration with 30 cubic centimeters of 1% novocain solution. Note that the point of the needle is now right in center of the deposit. *March 12, 1940.* Twenty-four hours after the infiltration therapy the doctor was somewhat improved. The spontaneous pain disappeared, and only attempt at motions of the shoulder caused pain.
March 14, 1940. Three days after the infiltration, the doctor "felt wonderful."
March 15, 1940. Four days after the infiltration, the doctor began to drive his car and attend to his patients, although the shoulder was "still stiff."

vise, between the head of the humerus and the overhanging rigid socket of the acromio-ligamentous vault. This probably is the reason why the tendinous cuff of the shoulder, especially its uppermost supraspinatus tendon is often subjected to chronic traumatization leading to degenerative changes with consequent calcification; or in case of a sudden, severe injury, tendinous tears may occur which likewise may later heal with formation of calcification.

Calcification in the Shoulder

Not infrequently, a small rod-shaped calcification may be found on the roentgenograms of the shoulder. This deposit is intratendinous and is usually located near the insertion of the supraspinatus tendon to the greater tubercle of the humerus. As long as the deposit is intratendinous, the shoulder may remain entirely symptomfree or the patient may have only occasional mild pain. It must be remembered that the supraspinatus tendon is interposed between the subacromial bursa above, and the cavity of the shoulder joint below (Fig. 1). The originally symptomless intratendinous deposit may gradually work its way upward towards the floor of the bursa causing inflammatory reaction in the bursal cavity. A "boil-like" lesion over the floor of the bursa has often been observed on open operations.

Finally the calcific masses may perforate the floor of the bursa and become extruded into its cavity. During this stage, acute symptoms develop. The patient suffers great pain, is unable to move his arm and is usually restless at night. The roentgenograms now may show that the originally sharply outlined intratendinous deposit became irregular and in addition to it, another hazy shadow may be found above it in the bursa (Fig. 2). The new shadow may be comparable to the smoke of a volcano during its eruption. The agonizing symptoms during this acute "eruption" of the originally intratendinous deposit into the bursal cavity may last for days and even weeks if left untreated, and are very often most distressing. It is chiefly during these acute episodes that the infiltration therapy often brings dramatic relief and is recommended by the writer.

Technic

The operation is performed in the x-ray room. A few cubic centimeters of 1% novocain solution are injected into the skin over the tender area after preliminary freezing with ethyl-chloride. This is followed by an injection of 10 to 20 cubic centimeters of 1% novocain solution through a large needle (gauge 18-20, 2" long) directed perpendicularly

Fig. 5. Roentgenogram of the same shoulder on March 18, 1940, one week after the infiltration. Note the diminution of density and wider spreading of the deposit which apparently is beginning to be absorbed. Slight stiffness and slight tenderness are still present.

Fig. 6. Roentgenogram of the same shoulder on September 30, 1940, six and a half months after the infiltration, showing complete disappearance of the deposit. The check-up roentgenogram and the examination of the right shoulder on May 5, 1942, about two years after the infiltration therapy were entirely normal. The shoulder has remained entirely symptomfree when the doctor was commissioned into the Army early in 1944.

towards, and close to the cortex of the head of the humerus. Control roentgenograms are taken with the needle in situ to make sure that its point is in the deposit (Figs. 3 and 4).

After that, the whole area is slowly infiltrated with 30 to 60 cubic centimeters of warm normal saline solution. Attempt is made to aspirate the calcareous material. If this is not successful, no further aspiration is attempted since the writer believes that the infiltration, rather than aspiration of the deposit has the main therapeutic effect.

While the operation can easily be performed in the office, it is wise to hospitalize the patient for the first twenty-four hours after this procedure since there is often an increase of pain for the first day or two. After this initial exacerbation the relief often comes with dramatic suddenness. In a few cases, relief has been noted immediately after the infiltration without any initial increase of pain.

Pathology

Most of the observers agree that the calcification is originally intratendinous. According to Moschowitz[4] "calcification only occurs in dead or inert tissue, that is, tissues that have no blood supply. It never occurs in tissues whose blood supply is abundant." Tendon is rather an avascular structure and when traumatized may heal with formation of calcification. It is doubtful that calcification may occur immediately after the injury; most probably it takes weeks or even months for the deposit to form.

However a latent and symptomless deposit may be activated by a trauma and cause severe disability. This most probably is due to the extrusion of the calcific material into the bursa caused by the trauma, thus inducing an acute bursitis.

The far greater frequency of calcification at the right shoulder speaks in favor of a traumatic origin of this lesion. Metabolic predisposition towards calcification should also be admitted as this condition occurs almost exclusively in persons past thirty-five years of age, and is very rare in younger individuals.

Summary

1. Calcific tendinitis is most frequently observed at the shoulder and is most probably a result of chronic or acute traumatization to which this joint has especial predispsition due to its hypermobility and its evolutionary changes.

2. Infiltration therapy rather than aspiration of the deposit is recommended in cases of acute calcific tendinitis. In cases of latent type, this therapy seems to be less efficacious.

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A New Treatment for Chorea

By A. L. MEYER, M.D., *Glendale, Long Island, N.Y.*

IN a paper on "Latent Jugular Phlebitis as Cause of Congestion of the Head," O. Meyer (1) suggested the removal of infection in the jugular veins as a cure for chorea.

The author has applied this therapeutic principle in several patients suffering from chorea with dramatic results. In all cases the symptoms of chorea disappeared within a few days.

The treatment is based on the generally accepted theory that chorea is caused by the effect of toxins on the brain. The correctness of this theory is proven by the fact that the disease is often preceded by tonsillitis or pharyngitis, that is a focus in the oral cavity; and that occasionally a cure or a temporary improvement results from the removal of the focus. But nevertheless, the therapeutic results obtained by removal of diseased tonsils are disappointing. In most cases the attacks persist or recur after a short time following removal of the oral infection.

These unsatisfactory results point to the presence of another focus besides those in the oral cavity. It has long been known that infections located in the oral cavity have a tendency to spread through the small connecting veins to the jugular veins, a factor which has been generally ignored until recently, although a number of papers have been written on this subject by prominent physicians.

The pathologists Dietrich (2) and Siegmund (3) have described how acute infections of tonsils and teeth cause infection of the jugular veins.

In 1939, Colby Hall (4) has proven pathologically that the venous route is the most important in the spreading of pharyngeal infections. He states: "The internal jugular vein receives blood from the pharyngeal and tonsillar plexus, usually by way of the common facial vein; also occasionally the anterior facial and a few pharyngeal veins may empty independently into the jugular. A thrombophlebitic process arising in the small veins of the pharynx reaches the general circulation by the same route." He comes to the conclusion: "Be not deceived by a comparatively innocent appearing pharynx as the veins of this pharynx may be carrying the death sentence for your patient." And he states further that the local signs of jugular phlebitis are often meager.

Once the jugular veins have become infected, they constitute a secondary, independent focus from which toxins enter the blood stream and affect the brain. If this secondary focus is not removed, the chorea persists even after the primary foci in the oral cavity have been eliminated.

O. Meyer (5) has pointed out that the infection of the jugular veins is by no means an isolated instance but occurs in most cases of an infection in the oral cavity. He has introduced the term "phlebotropism" to express the affinity of bacteria to the veins.

Diagnosis

The diagnosis of latent jugular phlebitis is simple. Palpation of an inflamed jugular vein discloses tenderness to pressure and often a palpable infiltration.

Phlebitis and the Brain

The effect of a jugular phlebitis on the brain is not limited to the action of the toxins which it produces. It also causes a venous congestion in the brain area, for as the jugular veins drain practically the whole head area, the inflammatory swelling of the endothelium of these veins which narrows their lumen must interfere with the venous drainage of the brain. Since every congested tissue is a locus minoris resistentiae to bacteria and bacterial toxins, it is logical to assume that inflammatory phlebostenosis of the jugular veins is apt to weaken the resistance of the brain tissue to the toxins produced in the jugular focus.

Venous congestion further weakens the power of the brain to resist the action of toxins by the accumulation of waste material and by the lack of oxygen due to the slowing up of the circulation. It is an established fact that the nervous tissue, and especially the cortex, is extremely sensitive to a subnormal supply of oxygen (anoxia), and to variations of the carbon dioxide content of the blood. Furthermore, as the venous pressure in the brain is practically equivalent to the intracranial pressure, increase of the venous pressure due to the venous congestion also increases the intracranial pressure thereby damaging the brain tissue.

Pathological observations also show that there is a congestion of the brain in chorea. M. G. Wilson (6) cites in her book a personal communication of Stevenson in which he states: "In a

recent case of a child of six years who died during an active chorea and carditis, the brain was studied in great detail. Edema of the meninges with perivascular and pericellular edema of the cortex was found . . . . In the lenticular and caudate nuclei, the vessels were greatly d i l a t e d and e d e m a was marked." And also: "In other instances there were occasionally encountered small hemorrhages in the brain and an occasional thrombosed vessel." And he comes to the conclusion: ". . .the effects on the brain must be largely toxic and reversible."

It can now be seen that latent jugular phlebitis exposes the brain not only to the effect of the bacterial toxins produced in the inflamed jugular veins, but also to the effects of the venous congestion which is caused by the narrowing of the lumen of the inflamed veins. These additional effects are accumulation of toxic waste material, lack of oxygen, and increased intracranial pressure.

Treatment

The logical treatment of chorea must aim at the elimination of the source of the toxins and at the decongestion of the brain. This is accomplished by first eliminating the primary foci in the oral cavity, as infected teeth or tonsils. After the oral cavity has been cleared of foci which feed the secondary focus in the jugular veins, removal of the jugular phlebitis eliminates the last source of toxins and at the same time decongests the brain by normalization of the lumen of the jugular veins thereby restoring a normal venous drainage of the brain area.

The author found that, as O. Meyer (7) suggests, application of leeches is the most effective method of treating jugular phlebitis. The author applies three or four leeches over each jugular vein with a leech applicator and lets the patient bleed for at least six hours after the leeches have fallen off.

Since there is such a close etiological relationship between chorea and rheumatic fever, the author has used the same treatment in several cases of rheumatic fever. The results were not as prompt and striking as in chorea, but nevertheless superior to any other form of treatment.

The author wishes that his observations may stimulate the interest of pathologists and clinicians in the problem of latent jugular phlebitis.

Summary

Chorea seems to be a symptom of the effect of toxins on the brain produced in primary foci in the oral cavity and in secondary foci in the jugular veins and of the effect of a venous congestion of the brain caused by the inflammatory phlebostenosis of the jugular veins.

Treatment consists in removal of the foci and in normalization of the lumen of the jugular veins.

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Surgical Treatment of Hypertension

The surgical treatment of hypertension by lumbodorsal splanchnicectomy appears to be a helpful adjuct to the medical management of many hypertensive patients. We have been investigating the possibilities of this form of treatment for the last eleven years but as yet have published very little concerning it.—Reginald H. Southwick, M.D., *Massachusetts General Hospital, Boston, Mass.*

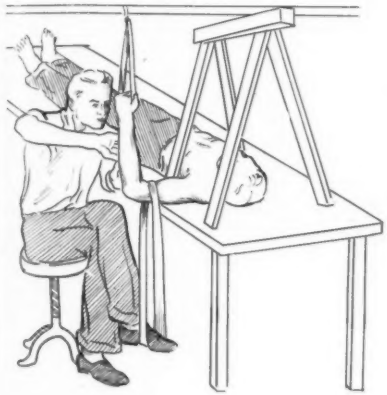
Simplicity in Fracture Treatment

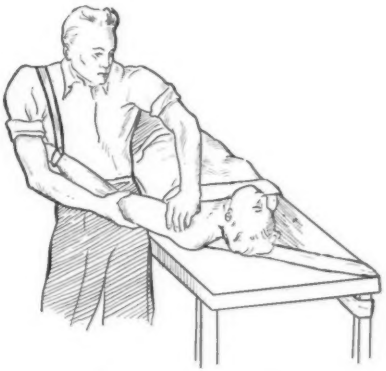
Adapted from photographs and material published in the *Mississipi Valley Medical Journal*, May 1944, and presented at War Sessions of the American College of Surgeons, 1943, and the 1943 meeting of the Mississippi Valley Medical Society, by Paul B. Magnuson, M.D., F.A.C.S., Professor of Bone and Joint Surgery, Northwestern University School of Medicine, Chicago.

◆

UPPER ARM FRACTURES

The patient must be attached to the table so that he will not be dragged off by traction. The countertraction is obtained through placing a bandage under the axilla on the injured side which is tied to the table leg on the opposite side. Another bandage is fixed around the elbow or wrist, as the case may require, and thrown over the operator's shoulder. The operator can then lean his weight against the pull of the arm muscles, leaving both hands free to manipulate.





FOREARM FRACTURES

Reduction of fracture of one or both bones of the forearm: The arm may be suspended from a cross bar by loops of one inch bandage around the fingers, the arm thus suspended with the elbow at right angles. A four inch bandage placed close to the elbow on the flexor surface of the upper arm serves as traction, applied against the counter traction of the loops around the fingers.

The operator may place his foot in the loop, applying traction to any extent that he wishes, leaving both hands free to manipulate, or he may hang weights from the loop and relieve himself of all muscular effort. In reducing fractures, it is necessary always to do away with muscular effort on the part of the operator or assistants because tired muscles go into clonic contraction and do not apply smooth, steady muscle-tiring pull.

Rotation of the forearm and angulation of the bones may be made freely and when the fragments are back in position, the doctor can apply plaster casing by aid of a pail of water placed at his feet) or board splints, and strap them in place.

FRACTURE OF LOWER LEG

Ordinary double window pulleys, one attached to the clove hitch fixed around the ankle and the other attached by a rope to the leg of the table, will multiply the operator's strength 400 percent. Counter traction is obtained by passing a sheet between the patient's thighs and fastening it to the head of the table. This apparatus will suffice to reduce fracture of the lower leg in most cases.

Sternal Injection of Fluids or Blood

THESE sketches illustrate the simplicity of injections into the sternum of the adult or into the tibia of the infant. This procedure can be quickly carried out on patients in shock whose veins are collapsed. Fluids or blood transfusions are absorbed from the marrow very rapidly. (See article on page 136 of this issue.)

The set up for sternal or tibial inspection.

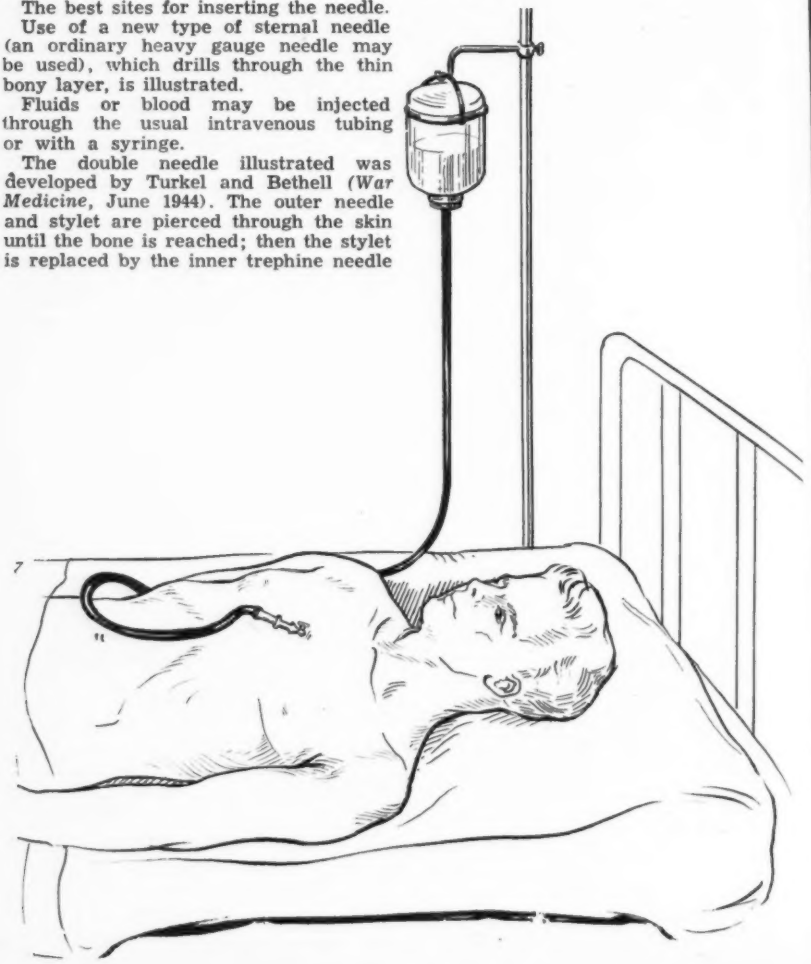
The best sites for inserting the needle.

Use of a new type of sternal needle (an ordinary heavy gauge needle may be used), which drills through the thin bony layer, is illustrated.

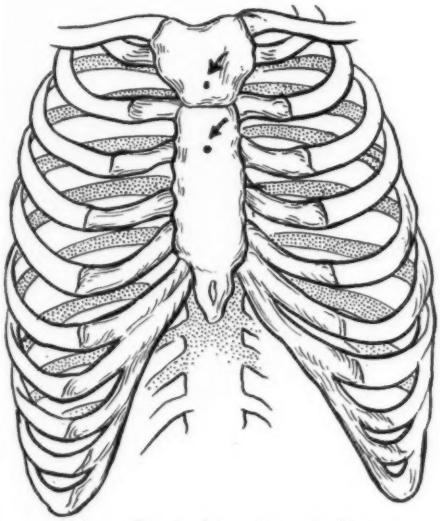
Fluids or blood may be injected through the usual intravenous tubing or with a syringe.

The double needle illustrated was developed by Turkel and Bethell (*War Medicine*, June 1944). The outer needle and stylet are pierced through the skin until the bone is reached; then the stylet is replaced by the inner trephine needle which drills a hole through the anterior lamella and retains the core instead of breaking it up into particles.

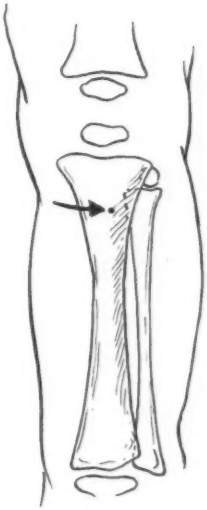
The outer needle is then pushed a predetermined distance into the prepared hole (with little force). The inner needle is then removed. After aspirating with a syringe (which indicates that the tip of the outer needle is in the sternal cavity), the instrument is ready for infusion.



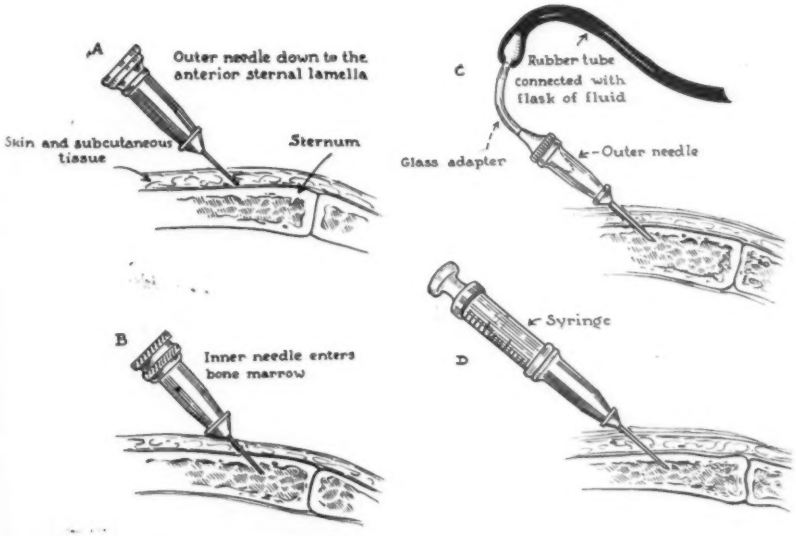
Sternal Injections of Fluids or Blood



Site of injection in adults



In infants



Finger Tip Injuries

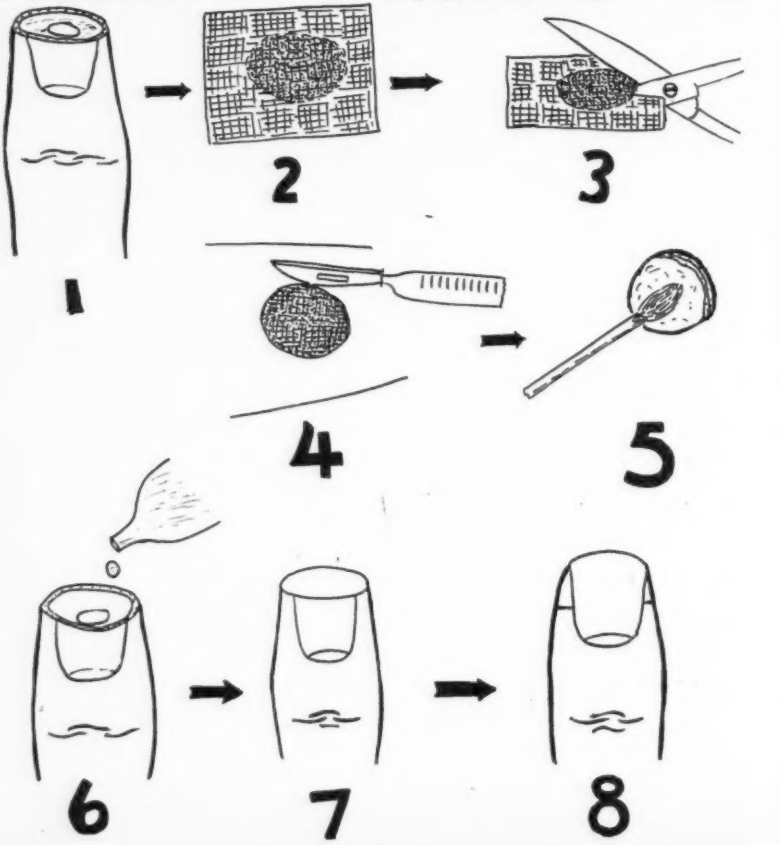
The loss of a finger tip is one of the most common accidents encountered in farm, industry or home. Instead of cutting off a portion of the bone to allow skin flaps to be brought over the end of the finger, it is just as easy to transplant a small portion of skin over the tip. In this way, there is no loss of finger length and no scar over the sensitive tip of the finger.

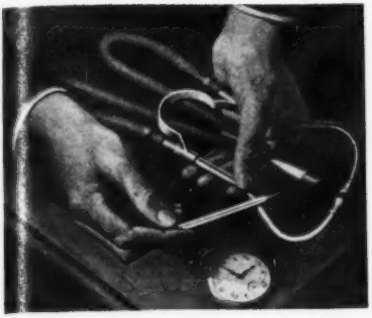
(1) illustrates a finger which has suffered a traumatic amputation of the tip. A gauze square (2) is placed over the end of finger and held there until the blood soaks through, thus outlining the size and shape of the finger.

This blood stained area (3) is cut out with scissors, the gauze outline placed on the normal skin area (4) of the arm or leg, and a superficial incision made. The entire circular area of skin is then cut off with scalpel and the raw side (5) painted with plood plasma.

Bleeding from the finger tip has meanwhile been checked by pressure, hot sterile saline solution and ligatures, if needed. Thrombin is dropped on the raw surface (6) the graft placed over the raw surface (7) and pressed down firmly. (8) illustrates the result 5 weeks later. The nail has regenerated to cover the area and the finger neither appears deformed nor does its function appear to be lessened.

If thrombin solution (1,000 units to the cc. made up fresh from the thrombin powder now available commercially) is not available, fine silk or cotton sutures on fine needles are used to attach the graft to the finger and a pressure dressing applied for 10 days. —R.L.G.





GRADUATE COURSE

Cancer of the Colon

Diagnosis

Discussion

By M. PINSON NEAL, M.D.,
Professor of Pathology,
University of Missouri
School of Medicine,
Columbia, Missouri.

The findings are variable, depending upon whether the tumor is an annular or a polypoid growth; whether it is ulcerated and infected or not, but generally we expect these signs and symptoms and in the order named:

1. Obstructive manifestations, with *change in bowel habit* and increas*ing constipation*
2. *Abdominal discomfort* with some *cramping pains* and often rectal tenesmus, particularly for carcinomas of the low sigmoid and rectum
3. Microscopic or occult blood in the stools
4. Alternating obstructive symptoms with diarrhea
5. Foul odor to feces
6. Gross blood

Discussion

By JOHN H. GARLOCK, M.D.,
Professor of Surgery,
New York Postgraduate Medical School,
New York City.

1. Right colonic cancer: Anemia, indigestion, occasional cramps.
2. Left colonic cancer: Lower abdominal crampy pains, increasing constipation, blood in stool.

Discussion

By J. A. BARGEN, M.D.,
Mayo Clinic, Rochester, Minnesota.

Rectal bleeding should be placed at the top of the list, with change in bowel habits, increasing constipation and crampy abdominal pains following.

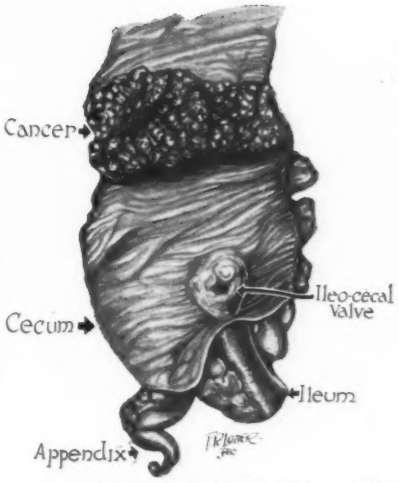


Fig. 1. Papillary carcinoma of the ascending colon just above the ileo-cecal valve (redrawn from Max Cutler "Cancer, Its Diagnosis and Treatment," published by W. B. Saunders Company, Phildelphia). This is the medullary or "cauliflower" type of cancer which is frequently found in the cecum and ascending colon. It tends to ulcerate and become infected early, resulting in bleeding, toxic symptoms and muco-purulent discharge.

Discussion

By H. M. KORNS, M.D.,
Department of Internal Medicine,
University of Iowa Medical School,
Iowa City, Iowa.

The most important signs in diagnosis of colonic carcinoma are:

1. Increasing constipation, change in bowel habit and alternating constipation and diarrhea; also, diarrhea alone.
2. Rectal bleeding or melena
3. Crampy abdominal pains

Fig. 2. Cancer of the rectum complicating prolapsing hemorrhoids. *Hemorrhoids are not the most serious cause of rectal bleeding. Never inject or remove hemorrhoids until the rectum has been explored with the finger and examined with the proctoscope or sigmoidoscope.* (Adapted from Hirschmans "Synopsis of Ano-Rectal Diseases," published by C. V. Mosby Company, St. Louis).

Discussion

By FRANK H. LAHEY, M.D.,
Lahey Clinic, Boston, Massachusetts

The most important sign is the earliest sign, and that is *rectal bleeding*. Cramping abdominal pain comes when the lesion, is late with obstruction. Increasing constipation and change in bowel function do come when it is late.

For that reason, I would place rectal bleeding first, and increased constipation and change of bowel habit, second and cramping abdominal pain, third.

Discussion

By WALTER H. KROMBEIN, M.D.,
Department of Medicine,
University of Buffalo Medical School,
Buffalo, N.Y.

For left colonic cancer, increasing constipation or change in bowel habit and occasionally rectal bleeding, are early symptoms and signs.

For right colonic cancer, crampy abdominal pains, alternating constipation and diarrhea and often an unexplained anemia, are important diagnostic clues.

Discussion

By ALTON OCHSNER, M.D.,
Professor of Surgery,
Tulane University Medical School,
New Orleans, Louisiana.

I believe that the most frequent symptom of right sided colonic carcinoma is either an *unexplained anemia* or *change in bowel habits*. These two are about equally divided in their frequency. Certainly vomiting has not been a frequent manifestation in my experience.

Not infrequently, the initial symptom is a *mass in the right lower quadrant* which the patient himself has noted.

Discussion

By N. S. DAVIS, M.D.,
Chicago, Illinois

The signs most important in diagnosing colonic cancer are: 1. Increasing constipation or change in bowel habit; 2. Crampy abdominal pain; 3. Rectal bleeding.

Discussion

By E. P. COLEMAN, M.D.,
Coleman Clinic, Canton, Illinois.

All these are important (crampy abdominal pain, increasing constipation or change in bowel habit and rectal bleeding). Also, vague abdominal discomfort in a middle-aged or old patient without definite history or findings of some other lesion, always, in this office, calls for a thorough rectal examination and colon x-ray with the thought of a malignant growth in mind. The main thing is for the physician to *think* of it.

Discussion

By R. B. CATTELL, M.D.
General Surgery, Lahey Clinic,
Boston, Massachusetts.

We feel that the most important symptoms and signs of right colonic cancer are abdominal pain and discomfort, weight loss, anemia and abdominal mass.

The most important signs and symptoms of left colonic and rectal cancer are rectal bleeding and change in bowel habit.

Discussion

By A. O. SINGLETON, M.D.
Professor of Surgery,
University of Texas,
Galveston, Texas.

Increasing constipation or change in bowel habit is the most important sign in the early diagnosis of colonic cancer.

Discussion

By WALTER ALVAREZ, M.D.,
Mayo Clinic, Rochester, Minnesota.

I think in cases of cancer of the cecum and ascending colon the first symptom sometimes is *anemia* due to oozing of blood from a large friable surface.

There may be pain, and fairly early the patient may discover a tumor.

Carcinoma of the left side of the colon is likely soon to produce some obstruction and then there is likely to be constipation. Constipation appearing for the first time in a person past middle age, who has always had normal bowel movements, should cause alarm.

Occasionally, there may be cramping pains which are relieved by a loud gurgle. Borborygmus appearing in older men is a danger signal.

With carcinoma of the rectum and sigmoid, *bleeding* is likely to be one of the earliest symptoms. It is a sad commentary on medicine today that a high percentage of patients with carcinoma of the rectum seen by the internist tell of a recent hemorrhoid operation.

In many cases of carcinoma of the colon, the first symptoms are loss of weight and strength.

Discussion

By DAVID C. DITMORE, M.D.,
Proctologist, Boston, Mass.

In the diagnosis of early right colonic cancer, I would consider *occult blood* in the stool and increasing *secondary anemia*, the most important signs in diagnosis.

In the diagnosis of early left colonic cancer, I should consider *rectal bleeding* and change in bowel habit (increasing constipation) the most important symptoms. Crampy abdominal pain and diarrhea appear later and evidence obstruction.

Diarrhea is not as good a term as *frequent bowel movements*. The patient complains that the first daily stool is essentially normal but the desire for defecation persists. He will attempt to evacuate but fecal material is essentially lacking, while there is an escape of abundant gas, moisture, more or less blood and mucous. This I term an *explosive stool*. It usually occurs not more than three or four times daily and is *almost pathognomonic*.

Change in the shape of the stool can no longer be considered an early cancer symptom since it can occur only in formed stools and will result from any distortion of the anal ring.

Fig. 3. Scirrhous obstructing form of cancer of colon, more commonly found in the descending colon, sigmoid and rectum. It causes obstruction with increasing constipation and cramping abdominal pains. (Adapted from Max Cutler.)

Discussion

By R. L. GORRELL, M.D.,
Director, Health Unit, Trinidad, Colorado
Editor, Clinical Medicine.

Cramping abdominal pain of intestinal character does not denote "colitis." Hemorrhoidal bleeding is usually bright red in color, but even the presence of hemorrhoids should not excuse the physician from examining the rectum and sigmoid for additional causes of bleeding. (See Fig. 2).

The presence of an abdominal mass which dents slightly on pressure and disappears after repeated enemas indicates that fecal impaction was present. In such cases, it is safest to study the

colon by x-ray to rule out a malignant tumor which caused the piling up of feces.

Some individuals, who are less sensitive to distress, will present themselves with abdominal distention (meteorism) due to partial intestinal obstruction.

Clinical Symptoms and signs	*Location of Cancer and type*
1. Bleeding	1. Ulcerating carcinoma of right colon, or of rectum (Fig. 1 and 2).
2. Loss of weight and strength	2. Carcinoma of cecum and ascending colon, early; left colonic and rectal cancer, late.
3. Indefinite indigestion and "run down condition"	3. Cancer of right colon
4. "Colitis"	4. Cancer in colon or rectum
5. Crampy abdominal pain	5. Left colonic, sigmoid or rectal cancer (see Fig. 3).
6. Anemia, secondary, (hypochromic) especially in male past 35 years of age	6. Cecum and ascending colon carcinoma, early
7. Persistent change in bowel habits (constipation for the first time, or increased constipation, mucous in stools, frequent movements)	7. Descending colon and sigmoid carcinomata cause obstruction (fig. 3), constipation and later cramping abdominal pains.
8. Abdominal pains, cramping	8. Left colonic cancer
9. Blood in stools (gross or chemical) found on examination	9. Cancer of colon or stomach; ulcer of duodenum or stomach.

Discussion*

By W. H. COLE, M.D.,
University of Illinois Medical School, Chicago, Illinois

Symptoms of cancer of the colon: A bowel habit change, with diarrhea or slight constipation to diarrhea, is an early symptom. Mild loss of appetite follows with slight weakness and weight loss, and anemia appears later. Gas (flatulence) and diffuse crampy abdominal pain (especially in sigmoid lesions, but cecal tumors may cause the same type of pain) appear. Crampy abdominal pains should not be dismissed as being due to enteritis.

A rectal and proctoscopic examination should be carried out, followed by a barium enema. In early lesions, especially in the splenic flexure, a small carcinoma is easily missed, even by very well trained radiologists. Barium should not be given by mouth if there is an evidence of obstruction, as it may become impacted and render primary resection impossible.

Occasionally, a mass may be palpable *but don't wait for it.*

After the diagnosis is made, one should palpate the liver and x-ray the lungs for metastases (peritoneoscopic examination will disclose many metastases, and save unnecessary explorations on inoperable patients—Ed.). If metastases are present, one should operate only because of obstruction.

Pre-surgical Care

The physical condition of the patient should be improved as much as possible; malnutrition and anemia should be corrected with an ample, low bulk diet, intravenous fluids and transfusions.

Before operating, one should know the level of the blood proteins (very important in determining when to operate), the non-protein nitrogen content of the blood, the hemoglobin and red cell count. If obstruction is not present, one may delay a few days while building up the patient by: 1. Forced feeding 4 or 5 times daily. 2. Concentrated high caloric diet with ample protein (no rough vegetables, aminoacids orally and intravenously, glucose intravenously and all vitamins).

If partial obstruction is present, one should give aminoacids, relieve dehydration and gastric retention. If the patient is losing ground, one may operate in 2 to 3 days to relieve the obstruction. If complete colonic obstruction is present, an immediate colostomy should be performed to prevent danger of perforation of the cecum due to distention, the ileocecal valve often not permitting regurgitation.

Succinylsulfathiazole

For five days preceding operation, succinylsulfathiazole in doses of 15 gm. daily, should be given to cut down the bacterial count and to decrease the possibility of peritonitis. Since employing this drug, one can carry out bolder operations; also, the number of days stay in the hospital is decreased.

Study of Symptoms

A study of patients indicates 1. symptoms of obstruction appear earlier in left colonic cancer, 2. symptoms have been present for a longer time in right sided lesions when the patients present themselves, 3. vomiting occurs in 19 percent

* From a paper presented before the Colorado State Medical Association, Sept. 29, 1944. Notes taken by R.L.G.

of left sided lesions, 25 percent of right sided lesions and 37 percent of transverse tumors, 4. vomiting is *not* related to obstruction, as *complete* obstruction low in the colon rarely causes vomiting, 5. obstruction was present in 16 percent of right colonic tumors, and approximately 60 percent of transverse and left colon cancers, 6. blood in the stools was noted in 30 percent of transverse, 40 percent of left and 50 percent of right colon tumors, 7. constipation appeared in 25 percent of right sided, 63 percent of transverse and 70 percent of left sided lesions, 8. anemia was found in 70 to 75 percent of patients with all types of colonic cancer.

Surgical Axioms

1. A colostomy should precede resection if obstruction is complete; the obstructive resection is used for partial obstruction.

2. A loop colostomy is preferable to a tube colostomy.

3. An "aseptic" technic is better than open anastomosis.

4. Leakage is the chief cause of death.

5. The mortality rate decreases with increasing experience of the surgeon.

6. Sulfonamides and penicillin are of value.

7. Silk or cotton should be used on outside layer of intestinal sutures.

Discussion

By JOHN M. WAUGH, M.D.,
Mayo Clinic, Rochester, Minnesota

The most important single factor in diagnosis as far as right and left colonic cancer is concerned would be the barium enema and roentgenologic examination of the colon by a competent roentgenologist.

Not infrequently we find that patients present themselves with cancer of the bowel with no symptoms and it is only on the routine x-ray examination that these early lesions are picked up. It is true that with lesions of the left side of the bowel, especially in the region of the sigmoid and rectosigmoid, that symptoms of obstruction are more likely seen than on the right side. Melena, crampy abdominal pain associated with increasing constipation with or without rectal bleeding is sometimes present. However, in contrast, on the right side, there is likely to be a palpable tumor and considerable anemia. The patient may or may not have been aware of blood in the stool. Lesions on the right side of the colon do not tend to obstruct until quite late so that pain may be absent.

Discussion

By CAPT. W. H. BUEERMAN
(MC)-V(S) USNR
Chief of Surgery, U. S. Naval Hospital, Oakland, California.

RIGHT

1. Ascending colon and cecum has a larger lumen—stool is liquid, lesions in right half of colon are more likely to invade wall of the bowel and ulcerate, than to invade the lumen and obstruct, hence crampy abdominal pain is usually a late symptom.
2. Right colon lesions are more likely to produce a diarrhea-like stool, with symptoms of gas and tenderness, not unlike appendicitis, in the early stages of the cancer. Often not constipated until late, with right sided lesions.
3. Rectal bleeding not a frequent symptom—may have dark, partially digested blood from lesions of right colon. Patients often have occult bleeding with marked anemia and relatively few abdominal symptoms in right colon carcinoma, during the early stages of the malignancy.
4. Tenesmus not seen in right colon carcinoma.

LEFT

1. Crampy abdominal pain is more frequent since stool is semisolid, and any lesion invading the wall of the colon may produce symptoms of beginning obstruction. Also scirrhous, constricting (napkin ring) lesions more frequently found in the left colon.
2. Increasing constipation more likely to be found in left colon lesions—together with alternating loose stools and constipated stool—and definite change of bowel habit.
3. Rectal bleeding more likely found in left colon lesions—blood bright and mixed with stool rather than streaked on stool as in "anal ring" benign causes of bleeding. *Bloody mucous a pathognomonic sign of carcinoma* in absence of a diagnosis of colitis (ulcerative).
4. Tenesmus often a sign of moderately advanced carcinoma of left lower colon.

Discussion

By HARRY MOCK, M.D.,
Professor of Surgery, Northwestern University School of Medicine, Chicago, Illinois.

The three most helpful symptoms in considering a diagnosis of left colonic malignant tumor are:

1. Increasing constipation
2. Crampy abdominal pains
3. Change in bowel habits

Editorial

Speransky's Theory of Disease

Last month we mentioned the possible importance of Speransky's theory of disease. Since then we have not met a doctor who knew what Speransky's ideas are. Therefore, we venture to return to the subject and give some of Speransky's observations as stated in his book, "*A Basis for the Theory of Medicine*."

"Neuro-dystrophic processes are not confined to a limited sphere. On the contrary, they enter into the composition of all pathological processes, — are not separable from them, and consequently do not constitute a separate chapter in pathology."

"The sympathetic nervous system is part of the central nervous system; and is fused with it morphologically and functionally."

"The nervous system has a direct influence on the chemical processes in the tissues."

"Apart from memory we do not know of a single nervous function which can be realized by itself, without change in the state of some other organ. The external manifestations of nervous processes in a complex organism must be as diverse as in general all the manifestations of life are."

"Nervous activity is accompanied by changes in matter."

"When an irritation occurs we shall have besides the traces of former damage a focus of new pathological excitations, drawing other and healthy parts into the process. Weak degrees of irritation have useful possibilities; strong ones inevitably do damage."

"As soon as one element of the nervous system is excluded the remainder enter into the new relationship one with another qualitatively."

Probably for many of us the Spillman articles will be more intelligible. (*American Review of Soviet Medicine*, October, 1944, pp. 79-89). For example, the Spillmans point out that the failure of the *focal infection theory* is explained by the dictum, "Disease ascribable to focal sepsis represents the result of a focus of irritation in the nervous system and the expression of this irritation bears no relation to the nature of the irritant in the primary focus. Moreover, once the disease commences, removal of the irritant in the primary focus cannot arrest the progress of the disease."

The Spillmans had spectacular success with the pumping therapy in rheumatoid arthritis. ("Pumping" is the withdrawal and reinjection of the spinal fluid.) Eighty percent of the subacute cases were discharged as cured at the end of three days. Relapses were common, but readily yielded to a repetition of the treatment. The subjective reaction was surprisingly good. The vasomotor disturbances also yielded to the treatment.

We should keep Speransky's analysis of the nervous system in mind as supplementary to our knowledge of pathogenic organisms and other forms of external disease, — for an "irritation" of the nervous system must follow every bacterial invasion, — and then comes the long chain of consequences which Speransky pictures.

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Merely having an open mind is nothing. The object of opening the mind, as of the mouth, is to shut it again on something solid. —*G. K. Chesterton.*

✦

Outline for the Physically Fit Layman of Tomorrow*

School Health and Physical Education

1. The candidate must be free from curable diseases and remediable defects including dental defects, halitosis, and body odors.

2. He must be immunized and vaccinated in accord with practices approved for the area of his residence. He should understand the nature and reasons of these practices.

3. He must know and understand the findings of his own chest X-ray, blood test, blood typing, blood pressure, and eye and ear examination.

4. He must be able to identify in himself and in others the onset (early

*By Arthur H. Steinhaus, Ph.D., Professor of Physiology, George Williams College, Chicago, Illinois.

stages) of illness and know how to secure appropriate medical and hospital services.

5. He must enjoy a wide range of wholesome nutritive foods, and know why these are desirable. He should know when and how to eat, and he must provide satisfactory evidence that he successfully regulates his bowel movements without recourse to medication of any kind.

6. He must have his own body weight under control and be able to modify it safely when needed, within limits controllable by diet.

7. He must possess good physical strength, endurance, flexibility, and posture; must understand the principles and methods for maintaining the same without reliance on "foundation garments." He should be able to run, jump, and swim well.

8. He must be free from handicapping habits relating to the use of alcohol, tobacco, the many pain killers, and dopes including the excessive use of caffein or benzedrine. Temporary exemption from this requirement may be permitted on recommendation of a qualified psychiatrist provided this psychiatrist is himself not addicted to the habit in question.

9. He must possess hobbies or other recreational habits consistent with the time and opportunities available to him.

10. He must be reasonably free from nervous instability and behave in accord with the best practices for maintaining mental health. He must have appropriate sleep habits.

11. He must give evidence of having attained a reasonably satisfying philosophy of life.

12. He must be informed of the best knowledge and practices surrounding courtship, mate selection, marriage, reproduction, the rearing of the succeeding generation, and finally of how sensibly and gracefully to accept the change that aging will bring to his own body.

Although some of these requirements may seem idealistic, even unreasonable, they are well grounded in scientific data and in widely tested human experience. We may be staggered by so great a concentration of good living. *Perhaps our generation has learned to enjoy what is expensive, fattening, or immoral.* These future people are more fortunate. They learn to enjoy good living and consequently it is no burden to them. They seek no martyr's glow to compensate the pains of dutiful living.

It is not to be expected that everyone will attain even a passing grade on such a health test, no more than that everyone should master Latin, calculus, or engineering. The race of people who will some day appear to set up standards such as these will take health education seriously. They will no more condone a habit dangerous to health than will the professor of engineering permit the calculation of bridge spans by outmoded formulae.

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Virus Pneumonia

There has been much discussion in the literature concerning the treatment of virus pneumonia. Sulfonamides have had no effect, unless secondary infection with susceptible organisms was present.

Penicillin was dramatically effective in several cases of virus pneumonia personally treated in a Marine Hospital, and reports of series of cases from Army Hospitals exhibit similar results.

Finland[1] fairly states what is considered to be the consensus of current opinion: "The large majority, if not all, of the fatalities from influenza and viral pneumonias are due to complicating bacterial infections. When the presence of such bacterial infections is recognized or suspected, early and intensive antibacterial therapy is indicated. Their presence is detected by the purulent character of the sputum and the finding of the pathogenic bacteria in significant numbers in direct smears or cultures of the sputum. The course and character of the disease are also usually modified when bacterial infection complicates a virus pneumonia."

"In influenza, patients who are acutely ill with high fever and marked prostration are the ones most likely to develop bacterial pulmonary complications, as evidenced by presternal pain, cough, purulent sputum, leukocytosis and signs of bronchitis or consolidation. These signs should be taken as evidence of complications and indications for treatment."

Oppenheimer[2] and Bernhard and Chapman[3] have reported a number of cases that responded well to roentgen therapy (100 *r* through a 20 by 20 port to the anterior chest, using 200 k.v. and Thoraeus filtration (H.V.L. equal to 1.95 mm. of copper) repeated in 24 hours. Prior to specific therapy, a number of radiologists reported good results from roentgen therapy of pneumonias.

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[1]Finland, Maxwell: Specific Treatment of Pneumonia. *Med. Clinics North Amer.*, Sept. 1944.

[2]Oppenheimer, A.: *Am J. Roentgen and Radium Ther.*, 49:635-638, 1943.

[3]Bernhard, R. W. and Chapman, D. W.: *J. Indiana S. Med. Assoc.*, 37:584-588, 1944.

CLINICAL NOTES and ABSTRACTS

Microfilm copies of any of the published papers here abstracted, up to 25 pages, may be obtained for 25 cents from Microfilm Service, Army Medical Library, Washington, D.C.

Bone Marrow Infusions in Children

IN adults the sternum is wide and vascular enough to be used with advantage and safety for infusions. The sternum of an infant, is *not* developed to such an extent as to make it a favorable site. The upper third of the tibia first, and the lower third of the femur second, are the sites of choice for intramedullary infusions in infants. Considering the softness of the bones in infants generally, it seems advisable that in infants of five years or under, the tibia and femur should be used. *Under no circumstances should the sternum be used in infants 3 years of age or less.*

Technic

The bone should be tightly grasped between the thumb and forefinger of the left hand to obtain a good impression of its thickness; the needle should be inserted at the midpoint of a line drawn between the two fingers. In the tibia, the anteromedial flat surface at the upper third of the bone should be used. In the femur, the needle is pointed slightly proximally in an anteroposterior plane.

Little pressure is generally required for the insertion of the needle in the bone of infants. The first movement should include penetration of the skin and subcutaneous tissues. The second movement is concerned with penetration of the periosteum and the bone itself; for this last movement a twisting rotary motion with slight pressure, on a fixed axis, is all that is required. A side-to-side motion, such as employed for leverage, should *not* be used to penetrate the bone.

A needle inserted in the bone, unlike that in a peripheral vein, is relatively fixed. It is possible, therefore, to allow the infant a certain amount of freedom when the fluid is being injected through the marrow. A loose loop of bandage around the ankle to keep the child from moving the leg too widely may be all that is necessary.

Since blood is approximately six times as viscous as water, one may have to use injection instead of infusion by gravity whenever blood is administered. Since the quantities in young infants seldom exceeds 100 cc., it has seemed convenient in most transfusions of this type to inject the entire amount by this method. The injection should in most instances, and especially in young infants, proceed at a rate not over 4 cc. per minute. For this purpose, a watch with a second hand should be held before the operator, and at every quarter of a minute 1 cc. is injected. This moderate rate of injection prevents overloading of the marrow, with possible injury. Like the peripheral veins, the emissary marrow veins are small and delicate and do not stand well excessive rates of flow.

Entering the Marrow Cavity

Only about 0.1 cc. or less of marrow should be removed by aspiration, or enough to make it certain that the needle is properly located. This is to minimize any damage to the marrow, with the possibility of hemorrhage and later local interference with the flow. Indication that the marrow cavity has been entered is obtained by dimunition in the resistance offered to the needle or, occassionally, by a gritting sensation. *No material should be injected or infused until marrow is clearly obtained by aspiration.*

If it is decided to allow the fluid to be infused by gravity, the reservoir should be fixed at a height of 4 to 5

feet above the level of the patient and so maintained throughout the infusion. Care should be taken so that there will be no breaks in the continuity of the pressure, which should be exerted from the surface of the fluid in the reservoir downwards and not from the surface of the liquid in the glass dropper, as in infusion apparatus equipped with poorly fitting, leaky bakelite screwing connections. Metal filters slow the infusion of blood considerably and should not be used. Immediately after marrow is obtained by aspiration, a syringe containing approximately 5 cc. of salt solution is attached to the needle and the solution injected slowly. This is followed at once by attachment of the adapter connected to the injection or gravity infusion apparatus, and the administration of fluid is started. The flow of fluid should be kept inwards; if the direction of the flow is allowed to be reversed, the patient's blood and marrow will rise in the needle, clot, and reduce or prevent any further flow.

It is not uncommon to observe a diminution in the rate of flow after one switches from plain salt solution to citrated blood. It is important to be sure that the blood has been properly citrated, and that no microscopic clots are present. Preliminary filtration through several layers of gauze is advisable whenever there is uncertainty as to the complete fluidity of the blood.

The rate of flow of the material being administered may be slowed and sometimes stopped by excessive crying of the baby. This can be modified by giving the baby sugared water or some other pacifier during the injection. Whenever possible it is desirable to quiet an unusually restless, crying baby by administering a sedative before the infusion. Only a loose bandage about the ankle, tied to a circumsion Y board or to the foot of the bed, is needed. — J. F. O'NEILL, M.D., in *Pa. Med. J.*, Sept. 1943.

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Primary Constipation: Treatment

A very useful adjunct in the treatment of constipation is additional amounts of ordinary table salt (NaCl). Alvarez suggested that if one quarter teaspoonful is added to a glass of water before breakfast, gratifying results are often observed. In the severly constipated patient, its use is always advised and the results are pleasing. The fact that an unlimited intake of NaCl is contraindicated in some diseases should not prejudice us against its use in normal individuals. It should be obvious that certain people require more salt than others, and that its use simply as a seasoning for foods may be insufficient in some cases. We have been under the impression that the so-called "constitutionally inadequate" individual sometimes obtains more benefit than is reasonable to explain simply because regularity in bowel habit is established, and perhaps there is some relationship between this improvement and the increase in well-being frequently seen when salt is given in large amounts to the person afflicted with Addison's disease.—D. C. DITMORE, M.D., in *Am. J. Dig. Dis.*, Sept., 1943.

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Reactions to Intravenous Mercurial Diuretics

Immediate reactions to the intravenous injections of mercurial diuretics (Salyrgan, Mercupurin) include (1) transitory dyspnea, (2) a generalized unpleasant sensation which the patient cannot define but dreads, (3) apprehension, substernal discomfort, slight increase in respiratory and pulse rate, and orthopnea or (4) moderate collapse, cyanosis, sweating with bradycardia or tachycardia.

Delayed reactions occur 1 to 2 hours after the injection and may show (1) typical asthmatic attacks or (2) pulmonary edema.

Severe or fatal reactions are very rare; they are characterized by (1) a marked fall in blood pressure, (2) cardiac arrest, cardiac irregularity, with or without marked bradycardia, (3) cyanosis or marked pallor of the face, (4) dyspnea with irregular, often gasping respiration, (5) unconsciousness and occasionally (6) convulsions.

Prevention of Reactions

Most fatal reactions have been preceded by symptoms of less severe reactions following previous injections. *Any reaction to the intravenous injection of a mercurial diuretic should be an indication to substitute other methods of treatment.* If mercurials are needed, they should be given orally, intramuscularly or in suppository form.

Don't stop the use of mercurial diuretics, as reactions are rare. They should be given only when clearly indicated, and any sign of reaction should contraindicate the intravenous route.—JACK WEXLER, M.D. in *Amer. Heart J.*, Jan. 1944.

Attendant (Practical) Nursing

Long before there were any schools of nursing, untrained women sometimes referred to as "born nurses" solved the problem of many households with no other resource in illness but a friendly neighbor willing to sit up at night with the patient while the tired family got a little sleep. In many cases of mild and chronic illness, there is still a definite need for a person with less skill.

In illness, the task of keeping the household machinery running smoothly is almost as important as the care of the patient and practical nurses are badly in need of instruction in both household economics and nursing procedures.

With the aid of nurses and physicians, therefore, a 14 months' basic course was planned and given partly in the headquarters of the Association (Household Nursing Association, Boston) and partly in a hospital, carrying out the chosen motto of: "For the Care of Sickness in the Home—For the Care of the Home during Sickness."

Course

The course begins in the practice house of the school, where the students spend six weeks before being sent to one of the affiliated hospitals for twelve months of training in bedside nursing. On completion of the hospital training, they return to the central school for a two weeks' senior course.

During the first six weeks they are taught cooking, care of the household, and elementary nutrition by qualified dietitians. They prepare their own meals and, under direction, do all the work of the practice house. This part of the course is of great importance to an attendant, as she fulfills only half her function in private duty if she is helpless in the kitchen. Cooking might be taught in a domestic science laboratory or in a hospital diet kitchen, but experience has shown that household training is better given in a practice house where the students go through the daily routine of a well conducted home. The right kind of an instructor can inspire enthusiasm for this part of the student's work and can make her realize how much she can contribute in the home by her skill in cooking and her knowledge of nutrition.

Also, during the preliminary course, nurse instructors lay the foundation for the hospital training by classes in elementary physiology and anatomy, care of the well child, and personal hygiene. A great deal of stress is placed on personal relationships, because the attendants seem to need this as much as, if not more than, anything else.

Instruction in Hospital

Each hospital employs a nurse-instructor to teach and supervise the students. Most of the nursing procedure is taught in the first two months, after which the students can give complete bedside care to the patient. The lessons in elementary physiology and anatomy are continued and are followed by lectures on diseases commonly cared for by attendant nurses.

For the final two weeks of the course, the student returns to the practice house, where she is prepared more adequately for private duty. This portion of the course includes electric cookery, experience in planning and buying food, and discussions with nurse instructors of situations which may be met in the home.

Educational Activities Differ

The fact that the student attendant cannot share the educational activities of the student nurse is one of the arguments against training the two groups in the same hospital. It inevitably leads to friction and discontent on the part of the attendant.

If the attendant is trained in a small general hospital where there are no student nurses and where her training is of first importance, she does not suffer from this feeling of inferiority.

Twenty-Four Weeks' Duty Before Receiving Diploma

A unique feature of the Household Nursing Association is that all attendants are required to do private duty under supervision for twenty-four weeks before the diploma of the school is awarded. The attendants are really graduates and earn good wages during this period. The cases are selected by the Registry to give as much variety as possible, and the attendants are supervised by our staff nurses, who have taught them during the preliminary training, have kept in touch with their work during the hospital training period, and are prepared to guide and help them in the first difficult months of private duty.

Twenty-Four Weeks' Duty Before Receiving Diploma

All are agreed on the need of the attendant nurse but perhaps there is no complete accord as to her field of usefulness. The attendant is becoming more important in hospital wards as the number of registered nurses steadily shrinks because of the calls for service with the armed forces. Five thousand

more attendants were added to hospital staffs all over the country during the past year. Many duties formerly performed by nurses can safely be carried out by attendants if supervision is given to make sure that the tasks entrusted to them are within their ability.

Greatest Need in the Home

Though the field of the attendant nurse is widening, the private home has the greatest need for her services, and it is here that she finds her best satisfaction. In the hospital and visiting nurse fields, she is only an auxiliary worker under the direction of the registered nurse, whereas in the home she is supreme and has the satisfaction of meeting a need for which her training has amply prepared her and which no one else can fill as well.

The young mother returning to a servantless home with a new baby, the business woman who must stay in bed in her one-room apartment, the mother who is incapacitated at home and needs care and someone to keep an eye on the children, the chronic invalid, and those convalescing from operations — to all these people the attendant nurse is invaluable. The highly trained nurse would be wasted in such situations and, of course, in these days is unobtainable. —KATHERINE SHEPARD, R.N., in *Wis M.J.*, Nov. 1943.

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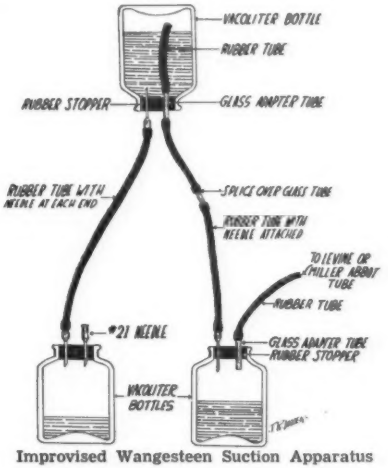
Improvised Wangesteen Suction Apparatus

By utilizing discarded plasma bottles, and tubing with attached needles from used plasma outfits, an efficient and satisfactory Wangensteen suction apparatus was improvised.

The glass tubing is usually broken when removing the rubber corks from the plasma bottles. It is suggested that a small end of the tube in the upper bottle be left in the cork and sealed off by heating over a gas flame. If the glass tube is removed from the cork completely air will leak into the system through the old needle hole. In the two places in the apparatus where glass tubing must necessarily pierce the stoppers the glass adapter that accompanies the plasma sets is forced through the cork so that the short piece of rubber tubing can be held in place as illustrated.

In the event that the lengths of rubber tubing are too short, the ends can be easily spliced over a piece of glass tubing from the plasma bottle and secured with adhesive tape.

It is further suggested that after using the dextrose and plasma outfits, a few of each be kept on hand in order that the described or a similar apparatus may be set up should the need arise."—Richard L. Thirlby, Lieutenant (M.C.) U.S.N.R., in *Naval Med. Bull.*, June 1944.



Improvised Wangesteen Suction Apparatus

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Opportunities in Orthopaedic Surgery

Question from physican in practice:

"What are the opportunities for specializing in orthopaedic surgery?

Answer:

Replying to your letter of November 7, I am enclosing for your information the Revised Rulings of the American Board of Orthopaedic Surgery which covers in part the questions you have asked.

Replying to your last question and speaking unofficially, I generally discourage men who think of giving up practice to enter specialized training in the various surgical branches, most of whom have family responsibilities and have gotten out of the habit of studying and of following hospital routines. Such men are at a disadvantage when they go back into resident training and unless they are very exceptional in their adaptability and energy, they do not work out very well. They usually become discouraged and give it up. There are occasional ones who make up the exceptions that prove the rule.

In general the requirements for specialty practice have been very definite during the last ten years and are hedged about with requirements which make it

impossible for a man to "polish off his training" in a few months' time and call himself a specialist. Most of the men leaving the service will doubtless need refresher courses in certain branches of work and can profitably combine a few months or a year in such work even though they continue in general practice. Many such courses will probably be available by the time the war ends. It would be a mistake for many of the older group to attempt to qualify for the specialties.

Guy A. Caldwell, M. D.

Requirements

(a) The Applicant must be a citizen of the United States or Canada.

(b) The Applicant must be a graduate of a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association. In the case of an applicant whose training has been received outside the United States or Canada, his credentials must be satisfactory to the Council on Medical Education and Hospitals of the American Medical Association and to the National Board of Medical Examiners; he must have been engaged in the practice of orthopaedic surgery in the United States or Canada for at least three years prior to the submission of his application.

(c) The Applicant must have served for an approved period (generally one year) an internship in a general hospital acceptable to this Board.

(d) The Applicant must be duly authorized to practice medicine in the state or province of his residence.

(e) The Applicant must be ethical and have good professional standing.

(f) The Applicant must be a member of the American or the Canadian Medical Association.

(g) Approved Plan of Training.

1. Resident Orthopaedic Training. The applicant should have served as resident for three years in orthopaedic surgery or on a fellowship in a hospital or medical school approved by this Board. This training period should have included instruction in the related basic sciences, orthopaedic surgery of adults and children and the treatment of fractures.

2. Practice Requirement. Prior to making application for examination, Part II, the applicant should have had at least two years further experience limited to the field of orthopaedic surgery. This requirement is intended not only to test the applicant's determination to practice his specialty in an ethical manner but also to take advantage of all existing opportunities to increase his clinical and scientific knowledge. Hospital training beyond the three years required will not be considered as actual practice unless the position of the candidate is considered permanent or his responsibilities are equivalent to those encountered in private practice. This means that interns, residents, fellows, graduate nurses and assistants will not be credited with a period of practice unless they are permanent members of the organizations with which they are associated.

3. Preceptorship. In certain instances the Board may recognize training under the preceptorship system. Applicants under this category must show evidence of having rereceived a rotating internship and at least one year of surgical training in an approved hospital, must have served for a period of at least five years as a full time assistant to an orthopaedic surgeon certified by the Board and, in addition, must have engaged in practice limited to orthopaedic surgery for a further period of five years. During this latter period he should have held a position on the staff of an approved hospital as orthopaedic surgeon and should have given evidence of scientific and professional ability.

4. Credits for Service with the Armed Forces. During the present national emergency, credits up to a maximum of two years may be allowed for experience gained in surgery and orthopaedics while serving with the Armed Forces. Credits will be given only upon presentation of evidence that such service has, in the opinion of the Committee on Eligibility, been equivalent to similar periods of approved hospital training. Record of all such military service should be kept in the Record of Professional Assignments prescribed by the Advisory Board for Medical Specialties and submitted with his application.

(a) A year of orthopaedic experience with the Armed Forces may be accepted to replace one of the three required years of orthopaedic resident training.

(b) A second year of orthopaedic service with the Armed Foces may be credited as a year toward the practice requirements.

Plaster Treatment of Burns

Method

One layer of sterilized petrolatum gauze is applied to the skin over the whole area to be covered by plaster. This is fitted exactly and is carefully placed between the fingers. This petrolatum gauze is cut from 44 mesh 3-inch wide rolls of bandage. This layer is covered with four layers of sterile open mesh gauze, fitted carefully without overlapping. The gauze does not go between the fingers but does surround the thumb. Very thin plaster slabs are then moistened and molded over the extremity front and back. A thin layer of rolled plaster completes a nearly skin tight, light, well fitting plaster which extends 3 to 4 inches above the burn. The fingers are placed in a semiflexed position. Fifteen hundred units of tetanus antitoxin is given at once and this dose is repeated in five days. Sulfadiazine is started in twelve to twenty-four hours only in the cases in which, in addition, severe burns are present in other parts of the body. It is continued as long as it seems to be indicated. The original cast is left in place for fourteen days. If the burn has not healed at the time of its removal, another is applied at once and left on for a further period of fourteen days, since infection, if present, sets in motion a train of events (increased lymph flow, swelling and so on) fundamentally similar to that following the original thermal injury. Further treatment, if necessary, after the fourth week is by other methods.

Absence of Local Harm

The early return of function that has been seen in these cases immediately after removing the casts is an indication that the method is usually harmless. It is further our impression that no areas of second degree damage have been converted to third degree by this method and that epithelization takes place at a rapid rate.

A certain warning concerning the technic of application should be given, as it is theoretically possible to do great damage by the improper application of these casts. The cast must extend over the tips of the fingers or toes even when the burn does not, and it must not provide any zones of increased pressure at any point. Glenn, Gilbert and Drinker present a photograph of a badly swollen foot when a cast was applied to the lower part of the leg of a dog without including the foot.

Absence of Toxic Absorption

Nothing harmful can be absorbed from the surface of burns treated with this method except the products of the burn itself or the products of bacterial invasion. Barnes and Trueta have shown that absorption of foreign materials is greatly delayed from immobilized tissues. A cast also protects against reinfection from new organisms. At the same time, the organisms already present either die out or become harmless. This point of view is confirmed by the experience of Cope, who found a remarkable tendency for organisms to become harmless under the pressure dressings that he used.

Comfort

From the start of treatment to complete healing the lack of pain experienced by these patients has been remarkable. As soon as the cast is applied, pain disappears. There may be a slight dull ache in the first three days. After this there is no discomfort and the arm in the cast can be moved freely. No throbbing pain, anesthesia or paresthesia has been noted. The patient can move the fingers a millimeter or so inside the cast, but this motion is painless. Removal of the cast at fourteen days is done without aid of analgesia or anesthetic, as practically no pain results, even during the use of a cast cutter. Apparently the lack of edema or the absence of active infection in the tissues avoids the condition of extreme sensitivity to handling that is frequently seen at this time in comparable burns.

Ease of Application

Close fitting plaster casts are relatively easy to apply, and the bulk of material (excluding water) is very little. Most doctors need no additional training in methods of applying plaster casts, although some may need encouragement before they will leave out the bulky materials customarily used in padded casts. Any man who has applied a satisfactory "skin tight" plaster to a fracture will have no difficulty at all with these casts.

Loss of Plasma

The minimal subcutaneous edema in and adjacent to the burned area possible under the cast, and the small amount of surface ooze that occurs, reduce to some extent the need for plasma replacement. If the area treated by the cast is extensive, the saving should be considerable.

Infection

Superficial sepsis was minimal in all cases, with only a small amount of exudate present on the dressings. Cultures showed a mixture of organisms,

with none predominating except in one case in which Pseudomonas aeruginosa was predominant. Self-limited cellulitis, unaccompanied by systemic reaction, was present in 1 case. None of the 3 patients whose burns were limited to the hands and arms developed any fever.

After-Care

During the time the cast is on, no time needs to be spent in doing dressings to the casted area. If the cast cracks from being made too thin, repair is easy. (The cast should be as thin as possible.) If the patient has to be moved during the period when the cast is on, no better protection against the normal traumas of transportation can be devised.

Healing

In the last analysis healing can take place only when natural defenses have created such conditions at the site of healing of temperature, pH salt content of the fluids, oxygen and carbon dioxide tension, nutritive elements, and enzymes that tissue cells can grow. In addition, toxic substances must be absent. Infrequency of disturbance of the environment of the injured area is therefore very important, because with each change of dressing one or more of these factors may be upset and hours or days must elapse before proper conditions can again be achieved. Under one of these casts, such disturbances of accidental nature are almost entirely prevented and those of deliberate nature (which may be just as harmful as the accidental ones, or even more harmful) such as arise from the curosity of the doctor to see what is happening, are largely discouraged. We believe that the healing of the skin has been as rapid as in similar cases treated in other ways and that return of motion has been more rapid.—S. M. LEVENSON, M. D., in *J. A. M. A.*, Oct. 1943.

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Heparin Dangers

One of the newer methods of treatment of thrombosis and especially pulmonary embolism, is the intravenous injection of heparin or the oral use of dicoumarin, both of which hamper and prolong coagulation of the blood.

This upsetting of a normal, protective mechanism has resulted in cerebral hemorrhage and fatal pulmonary hemorrhage.—T. J. Curphey in *Med. Times*, Apr. 1944.

[Dock, of New York City, who has so vigorously denounced bed rest, suggests that it would be better to *prevent* thrombosis by getting the patient out of bed in a few days rather than let a thrombosis develop and try to treat it with such a radical, unphysiologic method. —Ed.]

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Heroin in Labor

Heroin produces a rapid and intense analgesia which persists for three or four hours and gives adequate analgesia in about 90 per cent of cases. It has a desirable psychic effect characterized by euphoria without any depression or irritability of a physical or mental nature. This property is particularly valualbe in allaying the apprehension and fear of some primiparae. No adverse maternal effects have been observed. It is, however, contraindicated in cases of premature labor, as infantile deaths may take place where the infants are small and premature. The dosage should be minimal and the drug should be administered in the first stage of labour, preferably three or four hours before the anticipated time of delivery.—*Med. World* (Lond.), Sept., 1943.

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The Painful Foot

Persistent pain in a foot may be the result of an undiagnosed metatarsal fracture. (See Fig. 1.) The first x-ray may show only a thin, transverse hair-line like fracture through the cortex. This may require a reading glass for confirmation or be interpreted as normal in the early stages. After ten days, the fuzziness about the fracture site begins to appear, leading up to the pathognomonic fusiform (ring shaped) swelling of callus that has even been diagnosed as sarcoma.

X-ray should be repeated at 10 day intervals or an oblique exposure may be necessary to detect fissures.—J. E. JACOBS, M.D., in *Southern M. J.*, October, 1944.

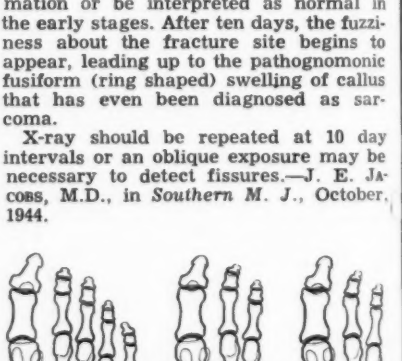

Fig. 1. A diagrammatic sketch of an x-ray showing: (1) Hairline fracture on first x-ray, (2) development at fracture site after 5 to 7 days, (3) fusiform swelling of callus at fracture site after 10 days.

DIAGNOSTIC POINTERS

Adenoid Recurrence Common

• Recurrence of adenoids after operation on children is so common that it must be considered normal. This recurrent lymphoid tissue may impair the function of the eustachian tubes and cause a chronic low grade catarrhal inflammation of the tube and drum leading to progressive deafness.

Treatment: Radium applications applied directly in nasopharynx by long applicator. Recurrent or hyperplastic nodules of adenoid tissue in and around the pharyngeal opening of the eustachian tubes are so located that they cannot be removed surgically.—S. J. CROWE, M.D., in *N.Y.S.J.M.*, Jan. 1, 1945.

(The nasopharynx is one of the "unknown" areas, as far as clinical examination or consideration is concerned. Through the nasopharyngoscope passed along the floor of the nose, a beautiful view of the posterior ends of the turbinates, adenoids, openings of eustachian tubes and upper pharynx is obtained; one can easily recognize enlarged adenoids, obstruction to the eustachian openings, tumors, hypertrophied turbinates. —Ed.)

Severe Respiratory Infections in Infants

• The staphylococcus causes severe respiratory infections in infants and young children.

Staphylococcus	Fulminating pneumonia	Bacteremia Empyema Lung abcess Pericarditis

Such infections often do not respond to sulfadiazine. Give penicillin if suspected or if staphylococci are found in the blood culture (10,000 units every 3 hours for first few days).—D. ANDERSON, M.D., in *Med. Clin. N. Am.*, Sept., 1944.

Early Awakening

• Awakening in the early morning is often a symptom indicating considerable anxiety.—EDWARD WEISS, M.D., in "Psychosomatic Medicine" (Published by W. B. Saunders Co.)

Exhaustion Syndrome

• As a direct result of overwork, a syndrome of extreme weakness with muscular atrophy and fascicular twitching may occur. It is clearly due to neuromuscular exhaustion. After a prolonged period of overwork, usually over a period of months, a final spurt of severe expenditure of energy results in exhaustion approaching paralysis. During the period of overwork, the patient feels unusually well (euphoric) and is insensitive to fatigue, until a sudden realization of exhaustion supervenes. Extreme weakness appears while restlessness continues, together with muscular cramps and pain, followed by flaccidity of muscles and fascicular twitching.—J. M. NIELSON, M.D. in *J.A.M.A.*, Nov. 25, 1944.

Differential Diagnosis of Apoplexy

• In the old person, the classical signs of brain tumor are often lacking, and the clinical appearance of vascular accidents, psychosis with cerebral arteriosclerosis or senile dementia may be duplicated.—I. S. ZFASS, M.D., in *Virginia Medical Monthly*, June, 1944.

Significance of Hoarseness

• Hoarseness lasting more than a few days suggests the presence of carcinoma, tuberculosis, syphilis, polyp or papilloma of the larynx. Hoarseness for a short period of time suggests acute laryngitis; intermittent hoarseness, chronic laryngitis.—F. L. WEILLE, M.D., in *Med. Clin. N. Am.*, Sept., 1944.

Eosinophilia in Hookworm Disease

• The presence of eosinophilia is often the only clue to hookworm infection. All patients with an eosinophile count of 10% or over, in the differential leukocyte count, should have repeated examinations of the stool to rule out this infestation.—A. MCMAHON, M.D., in *South. Med. J.*, Jan., 1944.

• The patient who cannot climb up on the step of the examining table without the help of the hands has a quadriceps weakness which is sometimes due to thyrotoxicosis.—W. ALVAREZ, M.D., in "Nervousness, Indigestion and Pain" (Hoeber, Publisher).

THUMBNAIL THERAPEUTICS

High Blood Pressure

• Reduction in weight, careful watch over the cardiac area, exercise restrictions if the myocardial status changes and relaxation from nervous tension are the essentials in the prevention or postponement of cardiac failure.

When myocardial failure finally appears, the hypertensive heart usually yields to modern cardiac management (digitalization, mercurial diuretic injections, no-salt diet).—D. W. ATCHLEY, M. D., in *New York State J. Med.*, December 15, 1944.

Plasma for Mumps Orchitis

• The results of the intravenous administration of 500 cc. of reactivated, dried pooled plasma were excellent in cases of mumps orchitis—pain disappeared quickly as did the fever, and the swelling rapidly subsided.—R. G. SMITH, M. D. (Lieut. MC U.S.N.R.) in *Naval Med. Bull.*, Jan. 1945.

Lung Abscess

• One-fourth of all pulmonary abscesses will clear up completely with conservative treatment. Another one-fourth will be cured by bronchoscopic aspiration. The remaining one-half will require external surgical drainage, by cautery incision into the lung.—O. T. CLAGGETT, M.D., in *M. Clin. North America*, Aug. 1944.

Mineral Oil for Constipation

• The rectal injection of mineral oil relieves spastic constipation with its accompanying hard, dry stools and abdominal distress. 15 to 30 cc. of oil are injected at bedtime.—C. A. ANDERSON, M. D., in *North Carolina Med. J.*, Mar. 1944.

Mineral Oil for Anal Irritation

• The injection into the rectum of 15 to 30 cc. of mineral oil relieves many cases of anal irritation and severe hemorrhoids. If the patient cannot retain 10 cc. of the oil, petrolatum (petroleum jelly) may be used.—C. A. ANDERSON, M. D., in *North Carolina Med. J.*, Mar. 1944.

Blood Transfusion Safeguards

• 1. Never use the husband as a donor for a wife and especially not if she is pregnant. The safe procedure is to use Rh-negative donor blood for all Rh negative women during pregnancy.

2. If a patient may need repeated transfusions, have him tested for the presence of the Rh Factor before any transfusions are given.

3. A history of repeated stillbirths or miscarriages in the mother, or jaundice in the newborn plus hemolytic jaundice, anemia and petechial hemorrhages (erythroblastosis fetalis) should arouse a suspicion that the mother is Rh negative.—J. S. LUNDY, M. D., in *M. Clin. North America*, Aug. 1944.

Treatment of Vincents Angina

• Swab the lesions once daily with Fowlers solution (liquor potassii arsenitis, U.S.P.). The patient is advised to use, at home, a peroxide mouth wash, Vince (sodium perborate powder) a level teaspoonful of the powder in a glass of hot water, and hexylresorcinol (S.T. 37) in a dilution of one to three with tap water (not hot). These medications are alternated every third hour, so that treatment is hourly.—F. L. WEILLE, M. D., in *M. Clin. North America*, Sept. 1944.

(Dentists at Marine Hospitals have found that daily forceful irrigation with hydrogen peroxide solution, after thorough dental cleansing, will cure even severe cases within a week.—Ed.)

Flea Bite Desensitization

• Injections of flea antigen are effective in desensitizing individuals who are sensitive to flea bites.—*Am. J. Trop. Med.*, 23; 377, 1943.

Treatment of Infantile Eczema

• A vanishing cream containing 5 percent liquor carbonis detergens (a liquid tar preparation) is effective for infantile eczema. Sulfadiazine should be applied locally if infecton is present. Protect the infant's skin against scratching, clothing, soap and water and bedding (cover it with cellophane). Give a high-fat, low carbohydrate diet.— L. E. HOLT, JR., M. D., in *J. Omaha Mid-West Clin. Soc.*, Aug. 1944.

NEW BOOKS

Any book reviewed in these columns will be procured for our readers if the order, addressed to CLINICAL MEDICINE, Waukegan, Ill., is accompanied by a check for the published price of the book.

FUNCTIONAL DISORDERS OF THE FOOT
Dickson, Diveley

FUNCTIONAL DISORDERS OF THE FOOT: Their Diagnosis and Treatment. *By Frank D. Dickson, M.D., F.A.C.S., Associate Professor, Clinical Surgery, University of Kansas Medical School and Rex. L. Diveley, M.D., F.A.C.S. Orthopedic Consultant, European Theater of Operations; Colonel, Medical Corps, Army United States. Published by J. B. Lippincott Co., 1944. Price $5.00*

A complete survey of foot problems, soundly based on anatomy and function, together with solution by medical and surgical means, has been written by two well trained orthopedists. The addition to this second edition of chapters on disorders of the feet in military service and in relation to industry make the book more valuable to the physician in service and to the physician caring for the greatly increased number of persons in industry.

CIVILIZATION AND DISEASE
Sigerist

CIVILIZATION AND DISEASE. *By Henry E. Sigerist, M.D., D. Litt., Ll.D., William H. Welch, Professor of the History of Medicine, Johns Hopkins University, Baltimore, Maryland. Published by Cornell University Press., 1944. Price $3.75.*

This combination of literature and medicine makes good reading for physicians, nurses and for interested laymen.

Epidemics, especially of plague, upset civilizations, stop wars in their courses. "History shows over and over again that the best prepared campaigns broke down under the impact of epidemics and lack of medical services."

The early recognition of the need to license physicians, the relation between disease and medicine, philosophical theories of disease with its four humors, the deadening effect of malaria on various peoples, the rise of eugenic sterilization in three countries, literature, art and music as related to medicine, and many other topics will broaden the views of the physician who thinks of illness as an individual matter.

DICTIONARY OF GYNECOLOGY AND OBSTETRICS
Taber

TABER'S DICTIONARY OF GYNECOLOGY AND OBSTETRICS. *By Clarence Wilbur Taber with the Collaboration of Mario A. Castallo, A.D., M.D., F.A.C.S. Published by F. A. Davis Co., Philadelphia, Pa., 1944. Price $3.50.*

This handy-like volume condenses, in slightly over 700 pages, all the essential facts of gynecologic and obstetric practice in definitions in alphabetical order. It is modeled after the other well known Taber lexicons, and is especially well suited for nurses, medical students, and the general prectitioner who wishes to find the latest information on a given subject speedily. The illustrations are clear and instructive, and numerous diagnostic tables add materially to the usefulness of the book. Especial mention should be made of the valuable series of definitions of infancy and its complications and management. The table of the hazards of post-natal life and the table of the common infectious diseases are really suitable for a much more comprehensive work. Such a lexicon as this obviates the necessity of searching for desired words through many pages of a general medical dictionary. We take pleasure in recommending this only dictionary of its kind as a real addition to the library of the gynecologist and obstetrician.—W. A. N. D.

ALL ABOUT FEEDING CHILDREN
Senn and Newill

ALL ABOUT FEEDING CHILDREN: An Authoritative Manual on What, When and How to Feed the Younger Generation. *By Milton J. E. Senn, M.D. and Phyllis Krafft Newill. Dr. Senn is Associate Attending Pediatrician, New York Hospital; Associate Professor of Pediatrics in Psychiatry, Cornell University Medical College. Published by Doubleday, Doran and Co., 1944. Price, $2.50.*

This book is of interest to pediatricians, physicians who care for infants and children, parents and nurses genuinely interested in proper feeding of their children.

Queries with regard to problems in feeding form the bulk of the questions asked of practitioners whose interest and practice includes the care of babies. A very fine survey of the feeding field in this new manual by Senn and Newill, produced by the collaboration of a skilled dietitian with a pediatrician trained in child psychiatry. In connected, well-written fashion these authors cover the field from the neonatal stage to 12 years of age, discussing such matters as: The breast-fed baby; the bottle-fed baby; dysfunction associated with eating; foods for your baby's first year; eating with the family; sweets and desserts; the school lunch box.

This book is an excellent reference for both physicians and the school dietitians, and may be warmly recommended to parents who request the name of "an authoritative manual on what, when and how to feed the younger generation."

Many good points on the psychology of the child, and the proper approach to problems by the adults, are worked in painlessly.—I.J.W.

A METHOD OF ANATOMY
Grant

A METHOD OF ANATOMY; Descriptive and Deductive. *By J. C. Boileau Grant, M.C., M.B., Ch.B., F.R.C.S. (Edin.), Professor of Anatomy in the University of Toronto, Toronto, Canada. Published by The Williams and Wilkins Co., 1944. Price $6.00.*

This book is of interest to surgeons and anatomy students interested in remembering anatomical facts.

All anatomical subjects covered in gross anatomy are found in this volume which has 750 original diagrammatic sketches which make it easy to see relationships and to remember them. The illustrations are unusual in that they are drawn to exact anatomical scale; they show the "key" muscle, nerve or artery by which all structures in the region can be grouped together and remembered; and wherever possible, they bring out practical applications.

The author writes in a simple, interesting style without the cumbersome terms and phrases that anatomists love to employ. He writes as one who knows the students' diffi-

culty in remembering details, does not expect them to learn minute, unimportant facts, demonstrates how one known fact is the peg on which to hang other facts to be learned. He presents scientific anatomy so it is easy to learn.

The only criticism that might be suggested is that nowhere in the book are to be found life like anatomical illustrations. If on the page opposite to the text and sketches, such an illustration could be found it would avoid the necessity of having several texts and would also help to bring out important points, as selected by the author.

THE ADRENAL GLANDS IN HEALTH AND DISEASE

Goldzieher

THE ADRENAL GLANDS IN HEALTH AND DISEASE. *By Max A. Goldzieher, M.D., Endocrinologist, St. Clare's Hospital, New York City. Formerly, Professor of Pathology, Royal Hungarian University, Budapest, Hungary. Published by F. A. Davis Co., 1944. Price, $8.00.*

A complete review of the anatomy, pathology, physiology and diseases of the adrenal glands is here presented. Because of the author's pathologic experience, the work is well grounded in pathologic anatomy, a rather unusual feature in an endocrinology text.

Clinical features, especially concerning adrenal insufficiency in infants ("pseudopneumonia of the newborn," acute adrenal insufficiency of infants and children), the probable role of adrenal insufficiency in fatal cases of diphtheria dying with signs of circulatory collapse (soft, feeble pulse, drop in blood pressure and cold extremities), and the treatment of Addison's Disease (chronic adrenal insufficiency) are well considered.

MANUAL OF MILITARY NEUROPSYCHIATRY

Solomon

CHIATRY: *Edited by Harry C. Solomon, M.D., Professor of Psychiatry, Harvard Medical School; Medical Director, Boston Psychopathic Hospital, and Paul I. Yakovlev, M.D., Clinical Director, Walter E. Fernald State School, Instructor in Neurology at Harvard Medical School, with 11 physician collaborators. Published by W. B. Saunders Co., 1944. Price, $6.00.*

This book is of interest to medical officers in areas remote from medical literature, physicians on induction examinations and those interested in a quick review of practical neurologic and psychiatric problems and what should be done for them.

Content: Psychoneurosis and psychosomatic disorders; psychopathic personalities; alcoholism; sexual deviates; malingering; feeble minded and defective delinquents; epilepsy and related syndromes; acute psychosis and confusion; principal psychoses; common diseases of the nervous system; syphilis of nervous system; meningitis; encephalitis; peripheral nerve injury; spinal cord injury; craniocerebral injuries and post-traumatic syndromes prevention and treatment; adminstration and disposition; induction; special topics.

The illustrated question and answer lecture (non-technical) to Army line officers would be of great value to all patients, and a few physicians who "do not believe" in psychiatry.

This book is very practical and to the point, especially as regards the neurologic topic, and within its confines the medical officer will find the answer to many of his questions.

ANALYSIS AND INTERPRETATION OF SYMPTOMS

MacBryde

THE ANALYSIS AND INTERPRETATION OF SYMPTOMS. *Edited by Cyril M. MacBryde, M.D., Assistant Professor of Clinical Medicine, Washington University School of Medicine, Director, Metabolism Division, Barnes Hospital, St. Louis. Published by J. B. Lippincott Co., 1944. Price $4.00.*

This book is of value to all physicians and surgeons interested in making a diagnosis.

Nervousness, fatigue, fever, headache mechanisms and differential diagnosis, thoracic pain, cough, hemoptysis, abdominal pain, hematemesis, melena, jaundice, joint pain, and obesity are each discussed by an experienced clinician.

Every attempt is made to help the physician who is confronted with a patient complaining of a symptom, such as chest or abdominal pain or headache, whose cause cannot be easily differentiated.

The usual textbook procedure is reversed in that the possible causes of the symptom are listed, then discussed in more detail so that the diagnosis can be made clear. It is not a "symptom book" alone but a logical discussion so that the physician is better able to make a diagnosis for the patients to come. Recent literature has been cited so that the work is very modern.

There are many good clinical notes and as a whole, the book is well balanced, to the point and interesting to read, if only as a review of current diagnostic thought.

COLLOID CHEMISTRY

Alexander

COLLOID CHEMISTRY: Theoretical and Applied, By Selected International Contributors. *Collected and Edited by Jerome Alexander. Volume V: Theory and Methods, Biology and Medicine. Published by Reinhold Publishing Corp., 1944. Price, $20.00.*

This book is of interest to physicians and surgeons who wish to really understand the body and its functions, rather than merely to read the latest fads and "clinical" articles which are often based upon fancy instead of physiological fact; all who are interested in colloid chemistry, medical authors, and editors, as a reference and "source" book.

Biology and medicine comprise over one-half of the book, with both basic and practical material included. Cannon's article on the maintenance of steady states in the body by its own regulatory mechanisms, should be read by everyone who empirically injects heparin, sodium choloride solution, dextrose and so on.

Medical topics include: Proteins, catalysis as a biological factor, photosynthesis, enzymes, vitamin A, minerals and vitamins in applied nutrition, the mechanism of hormone action, chemical pacemakers and physiological rhythmns, physical properties of protoplasm, immunology, capillary circulation, physical changes of muscle related to activity, inflammation, blood coagulation, allergy and anaphylaxis, cause and nature of cancer, the how and why of aging (by A. J. Carlson), the formation of concretions, aero-emphysema and caisson disease, war gases, psychiatry. Theory and method of colloid chemistry are covered thoroughly.

In the other section the respective authors, who are authorities in their respective fields, have given admirable details, graphs and tables but have not clearly shown in each case just what conclusions are of paramount importance.